

AFIP-3 Irradiation Summary Report

D. M. Perez
M. A. Lillo
G. S. Chang
G. A. Roth
N. E. Woolstenhulme
D. M. Wachs

April 2011



The INL is a U.S. Department of Energy National Laboratory
operated by Battelle Energy Alliance

DISCLAIMER

This information was prepared as an account of work sponsored by an agency of the U.S. Government. Neither the U.S. Government nor any agency thereof, nor any of their employees, makes any warranty, expressed or implied, or assumes any legal liability or responsibility for the accuracy, completeness, or usefulness, of any information, apparatus, product, or process disclosed, or represents that its use would not infringe privately owned rights. References herein to any specific commercial product, process, or service by trade name, trade mark, manufacturer, or otherwise, does not necessarily constitute or imply its endorsement, recommendation, or favoring by the U.S. Government or any agency thereof. The views and opinions of authors expressed herein do not necessarily state or reflect those of the U.S. Government or any agency thereof.

AFIP-3 Irradiation Summary Report

**D. M. Perez, M. A. Lillo, G. S. Chang,
G. A. Roth, N. E. Woolstenhulme,
D. M. Wachs**

April 2011

**Idaho National Laboratory
Idaho Falls, Idaho 83415**

<http://www.inl.gov>

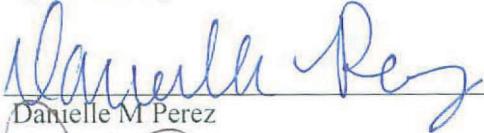
**Prepared for the
U.S. Department of Energy
Office of
National Nuclear Security Administration
Under DOE Idaho Operations Office
Contract DE-AC07-05ID14517**

AFIP-3 Irradiation Summary Report

INL/EXT-11-21776

April 2011

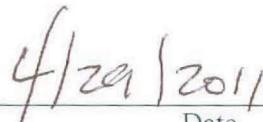
Approved by:



Danielle M Perez
Neutronic Analyst

4-29-2011

Date



Daniel M Wachs
Principle Investigator

4/29/2011

Date



Heidi W Glunz
Experiment Manager

4/29/2011

Date

SUMMARY

The Advanced Test Reactor (ATR) Full size plate In center flux trap Position (AFIP) experiment AFIP-3 was designed to evaluate the performance of monolithic fuels at a prototypic scale of 2.25 inches x 21.5 inches x 0.050 inches (5.75 cm x 54.6 cm x 0.13cm). The AFIP-3 experiment was fabricated by hot isostatic pressing (HIP) and consists of two plates, one with a zirconium (Zr) diffusion barrier and one with a silicon (Si) enhanced fuel/clad interface^{1,2}.

The following report summarizes the life of the AFIP-3 experiment through end of irradiation, including a brief description of the safety analysis, as-run neutronic analysis results, hydraulic testing results, and thermal analysis results.

CONTENTS

SUMMARY	i
ACRONYMS	v
1. EXPERIMENT GOALS	1
2. CONSTITUENT MASSES AND DENSITIES	2
3. EXPERIMENT HARDWARE.....	3
4. SAFETY ANALYSIS	9
5. IRRADIATION HISTORY.....	10
6. AS-RUN NUCLEAR ANALYSIS.....	12
6.1 Neutronics	12
6.2 Axial Gradient.....	20
7. HYDRAULIC TESTING	22
8. AS-RUN THERMAL ANALYSIS	23
8.1 Coolant Channel Temperature	23
8.2 Plate Surface Temperature	28
9. REFERENCES	36
Appendix A Individual Plate Power and Fission Density Plots.....	37
Appendix B Plate Surface Temperatures	49

FIGURES

Figure 1. MCNP model X-Y view of the AFIP-3 test assembly ³	1
Figure 2. DWG 635793 ATR Full Size Plate in Center Flux Trap Position (AFIP) Test Train Assembly.	4
Figure 3. Isometric view of the AFIP-3 Test Train Assembly.....	5
Figure 4. DWG-635789 REV 4 AFIP-3 Frame Assembly.	6
Figure 5. DWG-635788 REV 2 ATR Full Size Plate in Center Flux Trap Position Fuel Plate.	7
Figure 6. Radial Cross Section of the AFIP Test Train Assembly.	8
Figure 7. Hourly constrained lobe power history for Cycle 143B.....	10
Figure 8. Hourly constrained lobe power history for Cycle 144A.....	11
Figure 9. AFIP-3 axial neutron flux profile. ³	20

Figure 10. AFIP-3 corrected fission density axial profile. ³	21
Figure 11. Coolant channel temperatures as a function of location along the test assembly at BOC 143B (0.0 EFPD).	23
Figure 12. Coolant channel temperatures as a function of location along the test assembly at MOC1 143B (18.0 EFPD).	24
Figure 13. Coolant channel temperatures as a function of location along the test assembly at MOC2 143B (38.0 EFPD).	24
Figure 14. Coolant channel temperatures as a function of location along the test assembly at EOC 143B (57.3 EFPD).	25
Figure 15. Coolant channel temperatures as a function of location along the test assembly at BOC 144A (57.3 EFPD).....	25
Figure 16. Coolant channel temperatures as a function of location along the test assembly at MOC1 144A (77.3 EFPD).....	26
Figure 17. Coolant channel temperatures as a function of location along the test assembly at MOC2 143B (92.1 EFPD)	26
Figure 18. Coolant channel temperatures as a function of location along the test assembly at EOC 144A (101.0 EFPD).....	27

TABLES

Table 1. AFIP-3 experiment matrix loading diagram ⁴	2
Table 2. AFIP-3 constituent masses ⁴	2
Table 4. AFIP-3 Irradiation Hardware Drawing List.....	3
Table 5. Summary table of the safety analyses done for the AFIP-3 experiment.....	9
Table 6. Irradiation history for AFIP-3.....	10
Table 7. Cycle breakdown.	12
Table 9. End of cycle fission power density, surface heat flux, U-235 depletion and fission density for AFIP-3 experiment.....	13
Table 10. Cycle 143B, MCNP-Calculated heat generation rate and neutron flux for AFIP-3 fuel foils 0EFPD (BOC) Center Lobe Power at 24.9 MW. ³	14
Table 11. Cycle 143B, MCNP-Calculated HGR, Neutron Flux, Depletion, and Fission Density for AFIP-3 Fuel Foils, 18.0 EFPD (MOC1), Center Lobe Power at 24.9 MW (18.0 EFPD Cumulative) ³	14
Table 12. Cycle 143B, MCNP-Calculated HGR, Neutron Flux, Depletion, and Fission Density for AFIP-3 Fuel Foils, 38.0 EFPD (MOC2), Center Lobe Power at 24.9 MW (38.0 EFPD Cumulative) ³	15
Table 14. Cycle 144A, MCNP-Calculated HGR and Neutron Flux for AFIP-3 Fuel Foils, 0 EFPD (BOC), Center Lobe Power at 23.1 MW ³	16
Table 15. Cycle 144A, MCNP-Calculated HGR, Neutron Flux, Depletion, and Fission Density for AFIP-3 Fuel Foils, 20.0 EFPD (MOC1), Center Lobe Power at 23.1 MW (77.3 EFPD Cumulative) ³	16

Table 16. Cycle 144A, MCNP-Calculated HGR, Neutron Flux, Depletion, and Fission Density for AFIP-3 Fuel Foils, 34.8 EFPD (MOC2), Center Lobe Power at 23.1 MW (92.1 EFPD Cumulative) ³	17
Table 17. Cycle 144A, MCNP-Calculated HGR, Neutron Flux, Depletion, and Fission Density for AFIP-3 Fuel Foils, 43.7 EFPD (EOC), Center Lobe Power at 23.1 MW (101.0 EFPD Cumulative) ³	17
Table 18. Corrected fission power density (W/cc) and fission density (fissions/cc) for ATR Cycle 143B.	18
Table 19. Corrected fission power density (W/cc) and fission density (fissions/cc) for ATR Cycle 144A.	19
Table 20. AFIP irradiation vehicle flow conditions for each orifice configuration ⁶	22
Table 21. Temperature (°C) map of the east side of plate 3TT at EOC 143B (57.3 EFPD).....	28
Table 22. Temperature (°C) map of the west side of plate 3TT at EOC 143B (57.3 EFPD).....	29
Table 23. Temperature (°C) map of the east side of plate 3BZ at EOC 143B (57.3 EFPD).	30
Table 24. Temperature (°C) map of the west side of plate 3BZ at EOC 143B (57.3 EFPD).	31
Table 25. Temperature (°C) map of the east side of plate 3TT at EOC 144A (101.0 EFPD).	32
Table 26. Temperature (°C) map of the west side of plate 3TT at EOC 144A (101.0 EFPD).	33
Table 27. Temperature (°C) map of the east side of plate 3BZ at EOC 144A (101.0 EFPD).	34
Table 28. Temperature (°C) map of the west side of plate 3BZ at EOC 144A (101.0 EFPD).	35

ACRONYMS

Al	Aluminum
ATR	Advanced Test Reactor
AFIP	<u>A</u> TR <u>F</u> ull-size plate <u>I</u> n center flux trap <u>P</u> osition
CFT	Center Flux Trap
DAS	Data Acquisition System
DNBR	Departure from Nucleate Boiling Ratio
EFPD	Effective Full Power Days
GTRI	Global Threat Reduction Initiative
FD	Fuel Development
FIR	Flow Instability Ratio
HIP	Hot Isostatic Pressing
MCNP	Monte Carlo N-Particle
Mo	Molybdenum
RERTR	Reduced Enrichment Research and Test Reactor
Si	Silicon
U	Uranium
U-Mo	Uranium-Molybdenum
Zr	Zirconium

AFIP-3 Irradiation Summary Report

1. EXPERIMENT GOALS

In support of the Global Threat Reduction Initiative (GTRI) Fuel Development (FD) program (historically known as Reduced Enrichment for Research and Test Reactors (RERTR)), the Advanced Test Reactor (ATR) Full size plate In center flux trap Position (AFIP) experiment AFIP-3 was designed to evaluate the performance of monolithic fuels at a prototypic scale of 2.25 inches x 21.5 inches x 0.050 inches (5.75 cm x 54.6 cm x 0.13cm). The AFIP-3 experiment was fabricated by hot isostatic pressing (HIP) and consists of two plates, one with a zirconium (Zr) diffusion barrier and one with a silicon (Si) enhanced fuel/clad interface^{1,2}.

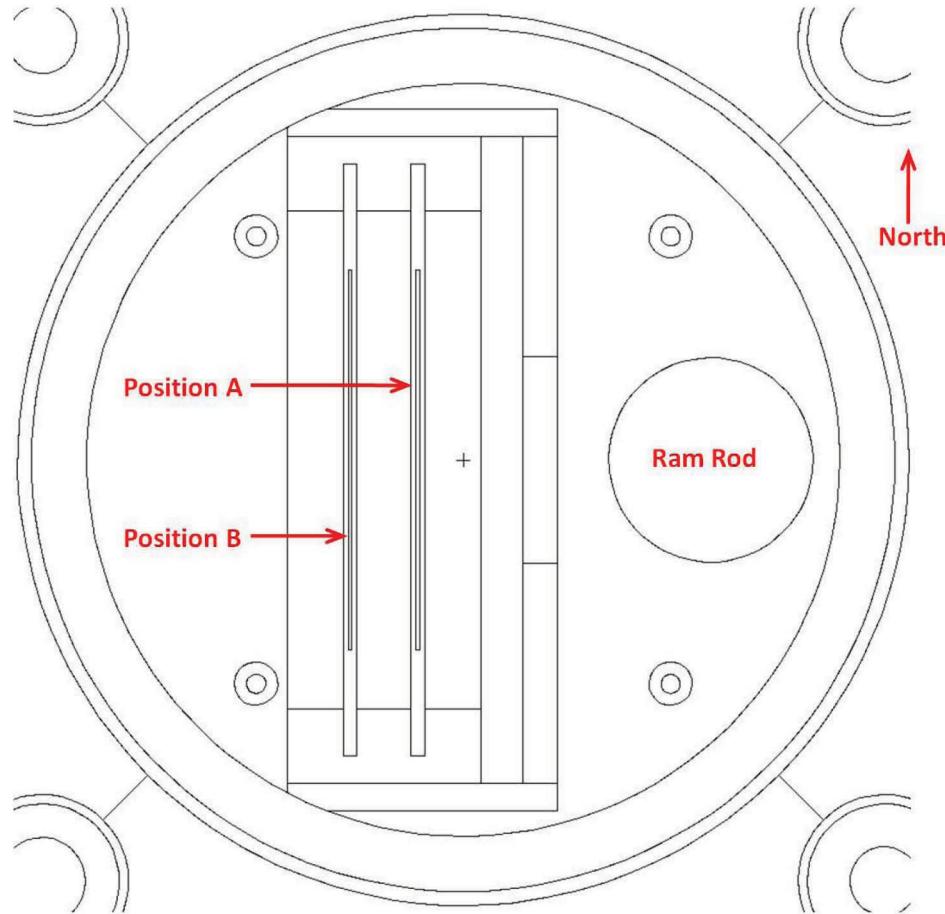


Figure 1. MCNP model X-Y view of the AFIP-3 test assembly³.

The AFIP-3 test assembly holds two full length (48 inch) frames, designated as A and B, a ramrod and four flux monitor wires. Frame A is located closest to the ramrod and frame B is on the outer (west) location in the assembly (see Figure 1). Each fuel plate is nominally 22.5 inches in length, 2.205 inches in width and 0.050 inches in thickness. The nominal fuel meat zone is 20.625 inches in length and 1.450 inches in width. The AFIP-3 experiment consisted of two fuel plates that were located in the A position of the test assembly with a plate on the top half of the frame and a plate on the bottom half. The experiment matrix is shown in Table 1.

Table 1. AFIP-3 experiment matrix loading diagram⁴.

Assembly Position	A-Position	B-Position
Top	U-10 Mo Thermal Spray Si HIP 3TT	Blank Al-6061 BT-Dum
Bottom	U-10 Mo Zirconium HIP 3BZ	Blank Al-6061 BB-Dum

2. CONSTITUENT MASSES AND DENSITIES

The constituent masses and densities for plate 3TT and 3BZ were obtained from the as-built data package⁴ plate summary sheets. Table 2 summarizes the constituent masses for both plates and Table 3 summarizes the constituent densities for both plates.

Table 2. AFIP-3 constituent masses⁴.

Fuel Plate Location	Fuel Plate ID	Total-U (g)	U-238 (g)	U-235 (g)	Zr (g)	Si (g)	Mo (g)
Top	3TT	95.19	76.37	18.82	--	0.137	10.94
Bottom	3BZ	98.64	79.55	19.55	9.47		11.34

Table 3. AFIP-3 constituent densities.

Fuel Plate Location	Fuel Plate ID	Fuel Meat Volume (cc)	Total-U (g/cc)	U-238 (g/cc)	U-235 (G/cc)	Zr (g/cc)	Si (g/cc)	Mo (g/cc)
Top	3TT	5.811	16.381	13.142	3.239	--	0.024	1.883
Bottom	3BZ	8.481	11.631	9.325	2.305	1.117	--	1.337

3. EXPERIMENT HARDWARE

The experiment hardware list for AFIP-3 is that used for all of the four-plate AFIP experiments. The drawing numbers and titles are in Table 4.

Table 4. AFIP-3 Irradiation Hardware Drawing List.

Drawing Number	Drawing Title
635791	ATR Full Size Plate in Center Flux Trap Position (AFIP) Flux Monitor Wire Holder Assembly Details
635792	ATR Full Size Plate in Center Flux Trap Position (AFIP) Plate Holder Tube Assembly and Details
635793	ATR Full Size Plate in Center Flux Trap Position (AFIP) Test Train Assembly
635790	ATR Full Size Plate in Center Flux Trap Position (AFIP) Ramrod and Ram Details
636544	ATR Full Size Plate in Center Flux Trap Position (AFIP) Holder Retriever Assembly and Details
635789	RERTR ATR Full Size Plate in Center Flux Trap Position Plate Frame Assembly and Details
635788	RERTR ATR Full Size Plate in Center Flux Trap Position Fuel Plate

The AFIP test train assembly as shown in Figure 2 shows the main components of the test assembly, which includes the flux monitor wire holders, the ram and ramrod, the frame assembly and the fuel plates. Figure 3 shows the test train assembly with the retriever attached to the top. The retriever is used to get the test train assembly out of the reactor. The flux monitor wire holders house the flux monitor wires. The ram is used to clamp onto the rails of the fuel plate frame assemblies to minimize vibrations and hold the fuel plate frame assemblies in place. The ramrod is the last component to be inserted; it is used to push the ram against the fuel plate frame assembly. The frame assembly holds the fuel plates into place and is shown in Figure 4. Figure 5 has the specific fuel plate dimensions and nominal fuel foil dimensions. Figure 6 is a radial cross section of the test train assembly and shows the locations of all the components.

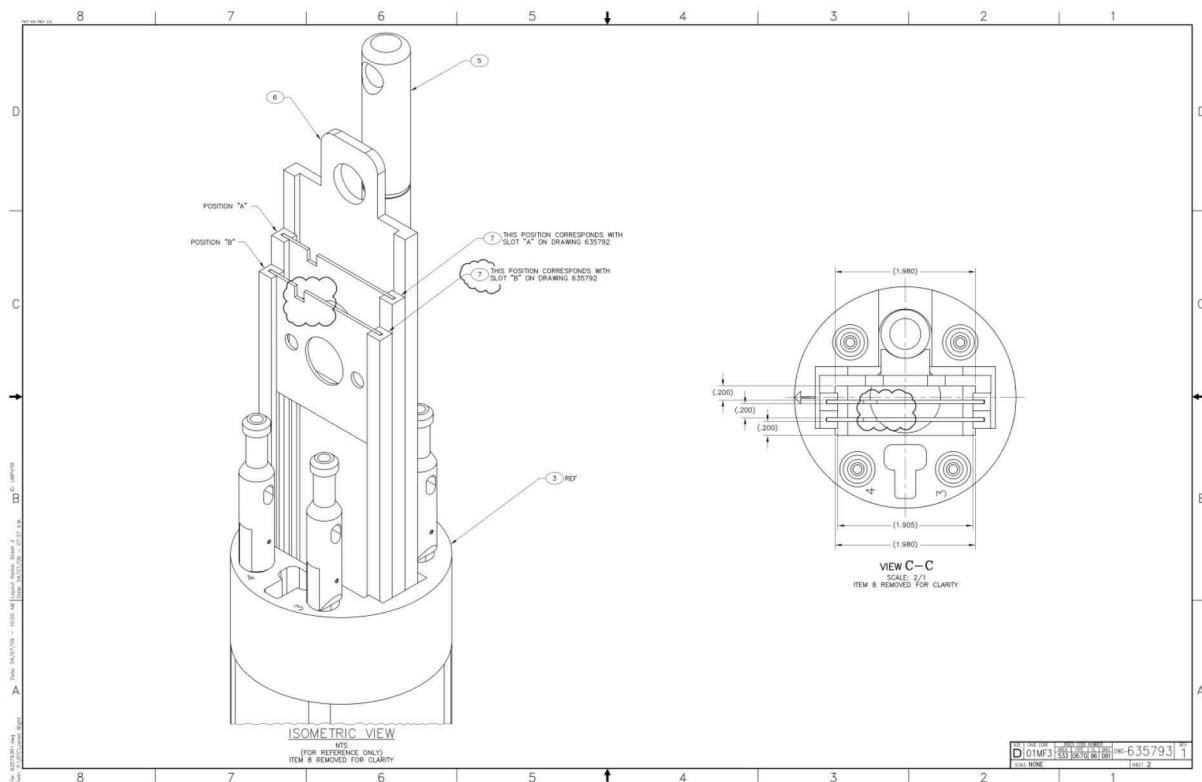
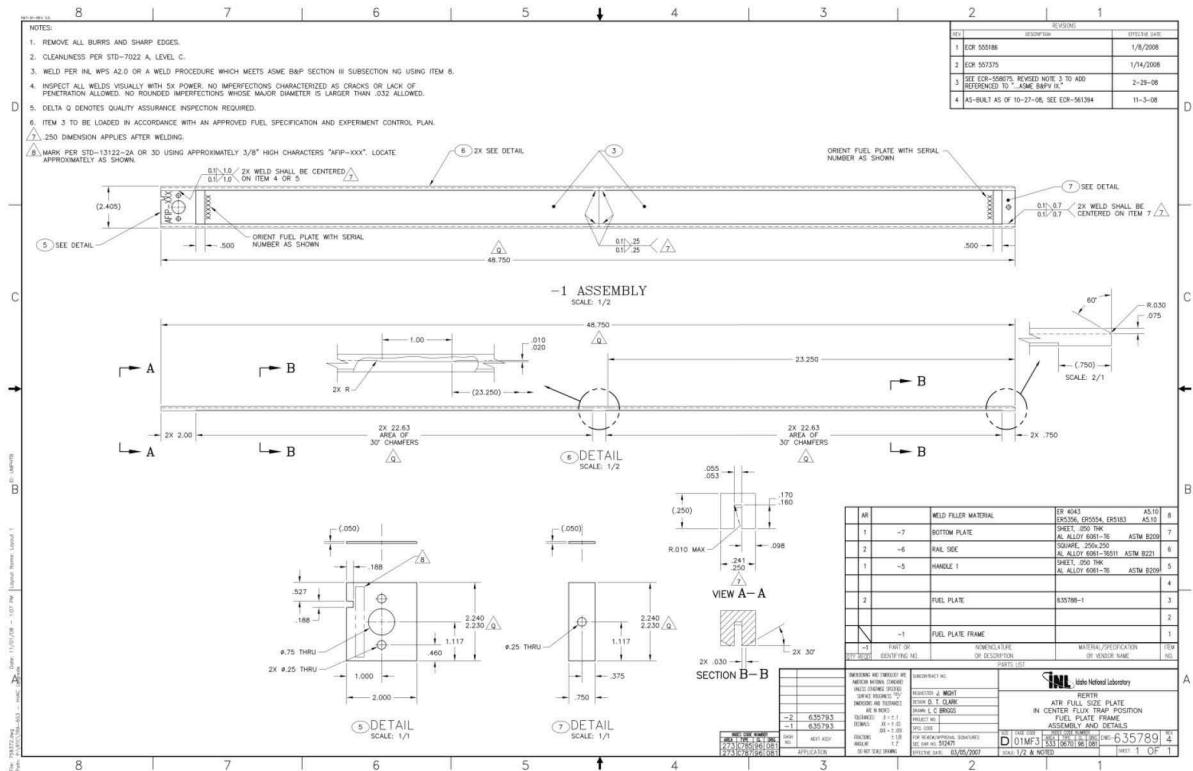


Figure 2. DWG 635793 ATR Full Size Plate in Center Flux Trap Position (AFIP) Test Train Assembly.



Figure 3. Isometric view of the AFIP-3 Test Train Assembly.



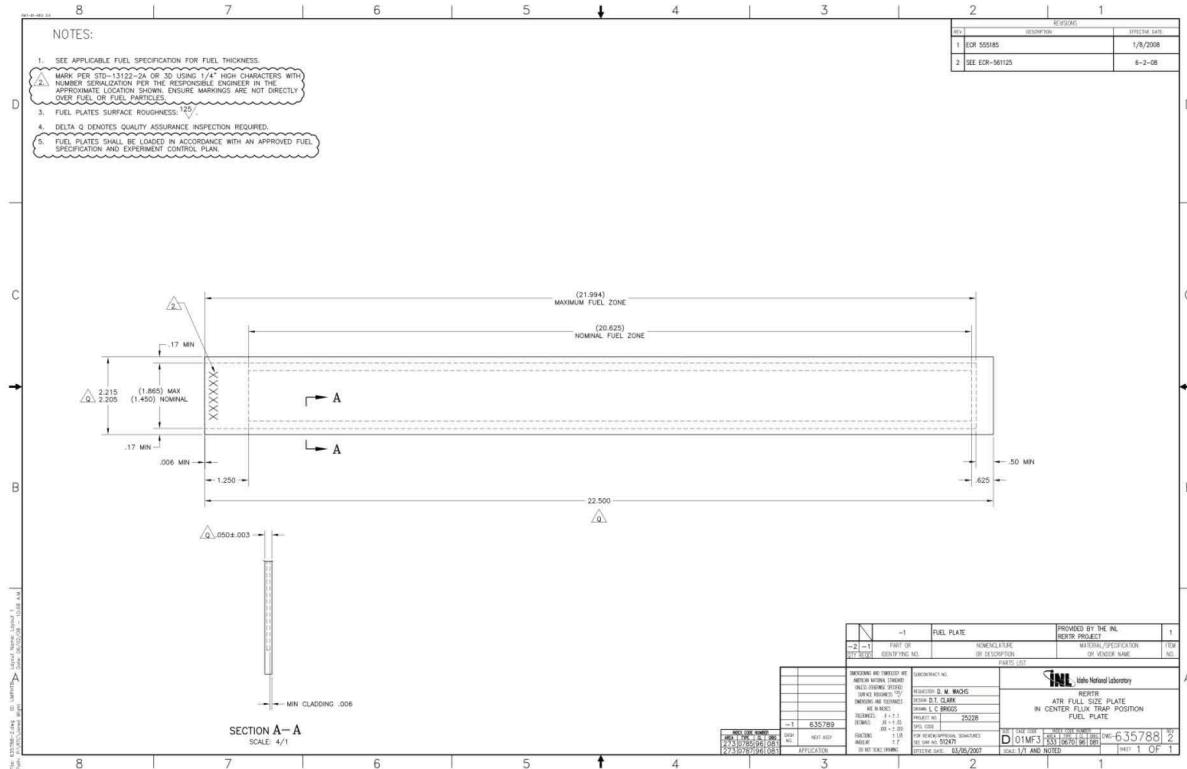


Figure 5. DWG-635788 REV 2 ATR Full Size Plate in Center Flux Trap Position Fuel Plate.

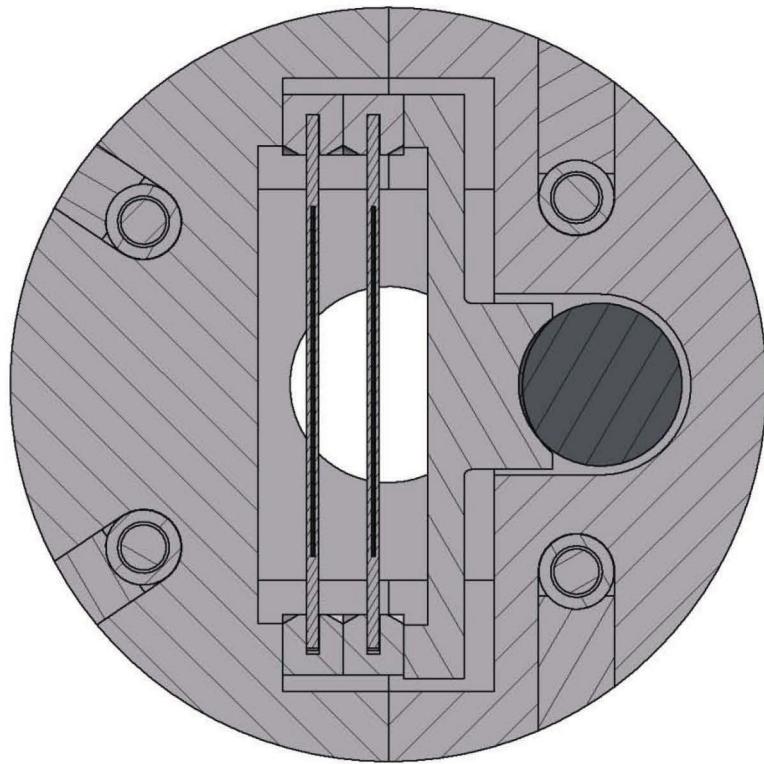


Figure 6. Radial Cross Section of the AFIP Test Train Assembly.

4. SAFETY ANALYSIS

The safety analysis that was performed on the AFIP-3 experiment includes thermal/hydraulic analysis, physics analysis, and structural analysis. The following table (Table 5) summarizes the safety analyses performed on the AFIP-3 experiment.

Table 5. Summary table of the safety analyses done for the AFIP-3 experiment.

ECAR Number	Description
ECAR-233	AFIP Four Plate Bounding Case Neutronics Analysis for the ATR Center Flux Trap Position
ECAR-260	Results of Four Fuel Plate AFIP Reactivity Measurements in the ATRC
ECAR-59, Rev. 2	Temperature Reactivity Coefficients for the AFIP Experiment in the Center Flux Trap of ATR
ECAE-258	Thermal Analysis of Four Plate AFIP Experiment
EDF-8209	AFIP Plate Frame, Test Train, and Backup Analysis (Structural)
ECAR-121	Total Flow Evaluations for AFIP and Backups
ECAR-126	RELAP Analysis for AFIP-2 Flow Restrictor
ECAR-432	Four Plate AFIP Experiment SIPT > ½ inch Pump Discharge Break Reactivity Transient Analysis

5. IRRADIATION HISTORY

The AFIP-3 test assembly was irradiated during cycles 143B and 144A in the ATR Center Flux Trap (CFT). Cycle 143B ran for 57.3 effective full power days (EFPDs) with a center lobe power of 24.9 MW (total core power of 113.0 MW). Cycle 144A ran for 43.7 EFPDs at a center lobe power of 23.1 MW (total core power of 107.2 MW).

There was one mid-cycle SCRAM during cycle 143B with duration of 2 days from dates 1/19/2009-1/21/2009. There were no mid-cycle SCRAM days during cycle 144A. This information is summarized in Table 6.

Table 6. Irradiation history for AFIP-3.

ATR CYCLE	AFIP Test ID	AFIP-3 Frames Irradiated	Dates Irradiated	Cycle EFPDs	Mid-Cycle Scram Decay Days	Post-Cycle Decay Days	Center Flux Trap Power (MW)	Total Core Power (MW)
143B	AFIP-3/1	A,B	12/23/2008 – 2/20/2009	57.3	2	21	24.9	113.0
144A	AFIP-3	A	3/13/2009 – 4/25/2009	43.7	--	16	23.1	107.2

The power history for each cycle is obtained as an ATR Surveillance Report from the ATR Data Acquisition System (DAS). The plots of each lobe power on an hourly basis are shown in Figure 7 for Cycle 143B and Figure 8 for Cycle 144A.

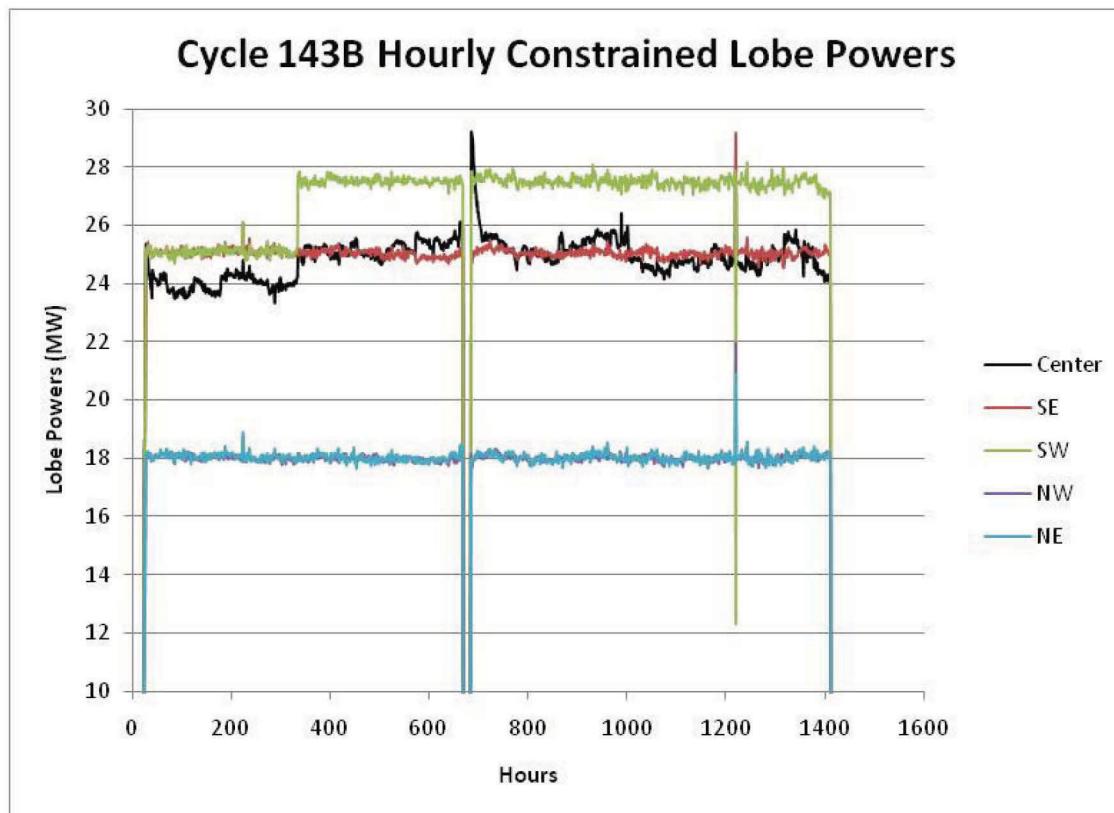


Figure 7. Hourly constrained lobe power history for Cycle 143B.

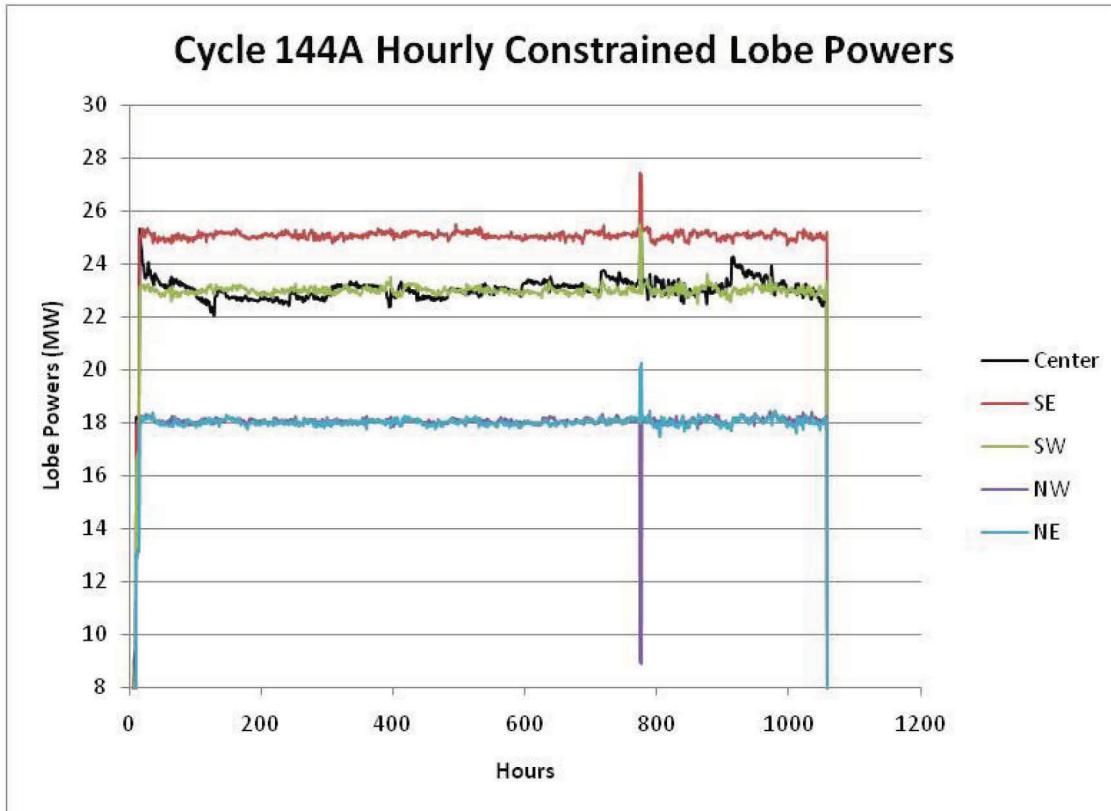


Figure 8. Hourly constrained lobe power history for Cycle 144A.

6. AS-RUN NUCLEAR ANALYSIS

6.1 Neutronics

The as-run calculations were performed using the irradiation history in Table 6, the Monte Carlo N-Particle (MCNP) code, ORIGEN2.2 and MCWO³. The calculated as-run fission heat rates, fission densities, and as-run U-235 burnup results for the fueled plates reported have an uncertainty band (1σ) of 2.5%³. The time intervals used to calculate the average plate power and burnup is shown in Table 7.

Table 7. Cycle breakdown.

Time Interval	143B (days)	144A (days)
BOC	0.0	0.0
MOC 1	18.0	20.0
MOC 2	20.0	14.8
EOC	19.3	8.9
Total EFPDs	57.3	43.7
Cumulative	57.3	101.0

The MCNP-calculated neutronic results reported³ were calculated using the fuel foil thickness measurements reported in the as-built data package⁴ as an “in-process” or approximate measurement of the thickness which includes the Zr barrier thickness for plate 3BZ. The actual fuel foil thickness measurements (without the Zr barrier) were calculated using density measurements and radiography⁵. To correct for the thickness change the fission density (fissions/cc) and the fission power density (W/cc) were scaled to the thickness measurement ratios shown in Table 8.

Table 8. Fuel plate thickness measurements.

Plate ID	“In-Process” Average Fuel Foil Thickness (in)	Measured Average Fuel Foil Thickness (in)	Thickness Measurement Ratio
3TT	0.0116	0.0127	0.9134
3BZ	0.0172	0.0142	1.2113

The MCNP-calculated end of cycle average plate power and burnup for cycles 143B and 144A are shown in Table 9. The average plate power and burnup for the time intervals for each cycle are shown in Table 10 through Table 17. The scaled fission power density (W/cc) and fission density (fissions/cc) are shown in Table 18 for Cycle 143B and Table 19 for Cycle 144A. The heat flux (w/cm^2) was not scaled since the surface area of the fuel foil (length and width) was represented correctly in the MCNP model. The plots of the fission power density and fission density as a function of the ATR Cycle time interval are in Appendix A.

Table 9. End of cycle fission power density, surface heat flux, U-235 depletion and fission density for AFIP-3 experiment.

Plate ID	MCNP Cell Elevation ^(a) (inches)	EOC 143B				EOC 144A			
		Fission Power Density (W/cc)	Surface Heat Flux (W/cm ²)	% Depletion U-235 (%)	Fission Density (fissions/cc)	Fission Power Density (W/cc)	Surface Heat Flux (W/cm ²)	% Depletion U-235 (%)	Fission Density (fissions/cc)
3TT	20.82	8294.20	122.19	20.26%	1.47E+21	8029.80	118.30	33.49%	2.47E+21
	18.76	9920.13	146.14	24.82%	1.83E+21	9424.12	138.84	40.60%	3.04E+21
	16.70	11099.71	163.52	29.12%	2.17E+21	10485.38	154.47	46.67%	3.54E+21
	14.64	12113.22	178.45	33.24%	2.51E+21	11204.39	165.06	52.27%	4.02E+21
	12.58	12853.59	189.36	36.37%	2.77E+21	11813.94	174.04	56.44%	4.40E+21
	10.52	13358.64	196.80	39.53%	3.04E+21	12113.84	178.46	60.16%	4.74E+21
	8.46	13779.11	202.99	41.37%	3.21E+21	12441.49	183.29	62.45%	4.97E+21
	6.40	13775.36	202.94	42.62%	3.32E+21	12339.42	181.78	64.03%	5.11E+21
	4.34	13727.60	202.24	43.76%	3.42E+21	12420.85	182.98	65.28%	5.24E+21
	2.28	13898.80	204.76	45.09%	3.54E+21	12522.45	184.48	66.80%	5.39E+21
3BZ	-2.28	9812.85	214.35	44.75%	2.49E+21	8852.79	193.38	66.39%	3.80E+21
	-4.34	9829.74	214.72	43.62%	2.43E+21	8782.56	191.85	65.10%	3.71E+21
	-6.40	9739.88	212.76	42.99%	2.38E+21	8791.34	192.04	64.48%	3.66E+21
	-8.46	9627.91	210.31	41.91%	2.32E+21	8849.31	193.30	63.27%	3.59E+21
	-10.52	9438.75	206.18	40.26%	2.21E+21	8691.82	189.86	61.16%	3.44E+21
	-12.58	9258.64	202.25	38.01%	2.07E+21	8454.58	184.68	58.47%	3.26E+21
	-14.64	8822.72	192.72	35.17%	1.90E+21	8213.87	179.42	54.83%	3.03E+21
	-16.70	8442.39	184.42	32.17%	1.72E+21	7762.38	169.56	50.68%	2.77E+21
	-18.76	7612.82	166.29	27.84%	1.47E+21	7111.14	155.34	44.97%	2.42E+21
	-20.82	6559.87	143.29	23.45%	1.23E+21	6231.93	136.13	38.32%	2.03E+21
MAX	NA	13898.80	214.72	45.09%	3.54E+21	12522.45	193.38	66.80%	5.39E+21
MIN	NA	6559.87	122.19	20.26%	1.23E+21	6231.93	118.30	33.49%	2.03E+21
AVG	NA	10598.30	187.83	36.32%	2.38E+21	9726.87	172.36	55.79%	3.73E+21

(a) Elevations for MCNP cells are reported at cell centroids relative to the modeled core axial midplane at 24.0 inches.

Table 10. Cycle 143B, MCNP-Calculated heat generation rate and neutron flux for AFIP-3 fuel foils OEFPD (BOC) Center Lobe Power at 24.9 MW.³

Plate ID	Cell	MCNP Cell Elevation ^(a) (inches)	Fission Power Density (W/cc)	Fission Heat Rate (W/g)	Surface Heat Flux (W/cm ²)	Neutron Flux (n/cm ² sec)
3TT	A-1	20.82	8140.97	444.70	119.93	4.43E+14
	A-2	18.76	10159.44	554.96	149.67	5.64E+14
	A-3	16.70	12349.66	674.60	181.94	6.95E+14
	A-4	14.64	14575.56	796.29	214.73	8.07E+14
	A-5	12.58	16557.63	904.46	243.93	8.99E+14
	A-6	10.52	18545.75	1013.06	273.22	9.79E+14
	A-7	8.46	19846.84	1084.27	292.38	1.05E+15
	A-8	6.40	20798.73	1136.13	306.41	1.09E+15
	A-9	4.34	21601.34	1179.97	318.23	1.13E+15
	A-10	2.28	22813.90	1246.37	336.09	1.15E+15
3BZ	A-11	-2.28	16106.33	1142.58	351.83	1.15E+15
	A-12	-4.34	15503.15	1099.79	338.65	1.14E+15
	A-13	-6.40	15036.52	1066.69	328.46	1.11E+15
	A-14	-8.46	14524.90	1030.40	317.28	1.08E+15
	A-15	-10.52	13722.46	973.47	299.75	1.04E+15
	A-16	-12.58	12672.77	899.01	276.82	9.62E+14
	A-17	-14.64	11338.88	804.38	247.69	8.83E+14
	A-18	-16.70	10132.16	718.78	221.33	7.91E+14
	A-19	-18.76	8479.24	601.52	185.22	6.64E+14
	A-20	-20.82	6955.91	493.45	151.94	5.40E+14
	MAX	NA	22813.90	1246.37	351.83	1.15E+15
	MIN	NA	6955.91	444.70	119.93	4.43E+14
	AVG	NA	14493.11	893.24	257.77	9.08E+14

(a) Elevations for MCNP cells are reported at cell centroids relative to the modeled core axial midplane at 24.0 inches.

Table 11. Cycle 143B, MCNP-Calculated HGR, Neutron Flux, Depletion, and Fission Density for AFIP-3 Fuel Foils, 18.0 EFPD (MOC1), Center Lobe Power at 24.9 MW (18.0 EFPD Cumulative)³

Plate ID	Cell	MCNP Cell Elevation ^(a) (inches)	Fission Power Density (W/cc)	Fission Heat Rate (W/g)	Surface Heat Flux (W/cm ²)	Neutron Flux (n/cm ² sec)	% Depletion U-235 (%)	Fission Density (fissions/cc)
3TT	A-1	20.82	8689.39	478.68	128.01	4.97E+14	5.95%	4.23E+20
	A-2	18.76	10968.19	605.36	161.58	6.31E+14	7.34%	5.28E+20
	A-3	16.70	12974.14	717.67	191.14	7.44E+14	8.86%	6.42E+20
	A-4	14.64	15081.03	836.04	222.17	8.49E+14	10.39%	7.57E+20
	A-5	12.58	16465.59	914.45	242.57	9.24E+14	11.69%	8.61E+20
	A-6	10.52	18155.05	1010.12	267.46	1.00E+15	12.99%	9.64E+20
	A-7	8.46	19051.05	1061.36	280.66	1.06E+15	13.80%	1.03E+21
	A-8	6.40	19556.18	1090.43	288.10	1.07E+15	14.45%	1.08E+21
	A-9	4.34	20452.97	1141.38	301.31	1.10E+15	14.95%	1.12E+21
	A-10	2.28	20811.03	1162.49	306.59	1.10E+15	15.68%	1.19E+21
3BZ	A-11	-2.28	14766.67	1069.34	322.56	1.10E+15	15.61%	8.37E+20
	A-12	-4.34	14327.79	1036.69	312.98	1.10E+15	15.05%	8.06E+20
	A-13	-6.40	14214.99	1028.02	310.51	1.09E+15	14.63%	7.81E+20
	A-14	-8.46	13795.09	997.08	301.34	1.07E+15	14.19%	7.55E+20
	A-15	-10.52	13200.01	953.14	288.34	1.03E+15	13.44%	7.13E+20
	A-16	-12.58	12266.97	884.61	267.96	9.80E+14	12.50%	6.59E+20
	A-17	-14.64	11419.32	822.14	249.44	9.10E+14	11.28%	5.89E+20
	A-18	-16.70	10274.51	738.58	224.44	8.29E+14	10.13%	5.27E+20
	A-19	-18.76	8766.56	628.89	191.50	7.08E+14	8.55%	4.41E+20
	A-20	-20.82	7329.85	524.79	160.11	5.84E+14	7.06%	3.62E+20
	MAX	NA	20811.03	1162.49	322.56	1.10E+15	15.68%	1.19E+21
	MIN	NA	7329.85	478.68	128.01	4.97E+14	5.95%	3.62E+20
	AVG	NA	14128.32	885.06	250.94	9.20E+14	11.93%	7.53E+20

(a) Elevations for MCNP cells are reported at cell centroids relative to the modeled core axial midplane at 24.0 inches.

Table 12. Cycle 143B, MCNP-Calculated HGR, Neutron Flux, Depletion, and Fission Density for AFIP-3 Fuel Foils, 38.0 EFPD (MOC2), Center Lobe Power at 24.9 MW (38.0 EFPD Cumulative)³

Plate ID	Cell	MCNP Cell Elevation ^(a) (inches)	Fission Power Density (W/cc)	Fission Heat Rate (W/g)	Surface Heat Flux (W/cm ²)	Neutron Flux (n/cm ² sec)	% Depletion U-235 (%)	Fission Density (fissions/cc)
3TT	A-1	20.82	9375.99	521.56	138.13	5.27E+14	12.92%	9.33E+20
	A-2	18.76	11465.29	640.74	168.91	6.64E+14	16.11%	1.17E+21
	A-3	16.70	13389.70	751.58	197.26	7.85E+14	19.09%	1.40E+21
	A-4	14.64	15059.61	849.03	221.86	8.83E+14	22.06%	1.64E+21
	A-5	12.58	16434.11	929.66	242.11	9.56E+14	24.39%	1.83E+21
	A-6	10.52	17640.97	1001.56	259.89	1.02E+15	26.79%	2.03E+21
	A-7	8.46	18445.10	1049.50	271.73	1.06E+15	28.20%	2.15E+21
	A-8	6.40	18929.58	1078.59	278.87	1.08E+15	29.17%	2.23E+21
	A-9	4.34	19128.86	1091.84	281.81	1.09E+15	30.26%	2.32E+21
	A-10	2.28	19696.24	1125.85	290.17	1.10E+15	31.23%	2.41E+21
3BZ	A-11	-2.28	13750.36	1016.79	300.36	1.09E+15	31.10%	1.70E+21
	A-12	-4.34	13552.64	1000.96	296.04	1.10E+15	30.14%	1.65E+21
	A-13	-6.40	13358.63	985.96	291.81	1.08E+15	29.63%	1.61E+21
	A-14	-8.46	13089.84	964.98	285.93	1.07E+15	28.80%	1.56E+21
	A-15	-10.52	12585.86	926.17	274.93	1.04E+15	27.53%	1.49E+21
	A-16	-12.58	12060.52	885.18	263.45	9.97E+14	25.70%	1.38E+21
	A-17	-14.64	11156.43	816.51	243.70	9.32E+14	23.65%	1.26E+21
	A-18	-16.70	10319.95	753.02	225.43	8.51E+14	21.39%	1.13E+21
	A-19	-18.76	9008.44	654.53	196.78	7.39E+14	18.27%	9.55E+20
	A-20	-20.82	7537.32	545.48	164.65	6.05E+14	15.29%	7.91E+20
	MAX	NA	19696.24	1125.85	300.36	1.10E+15	31.23%	2.41E+21
	MIN	NA	7537.32	521.56	138.13	5.27E+14	12.92%	7.91E+20
	AVG	NA	13799.27	879.47	244.69	9.34E+14	24.59%	1.58E+21

(a) Elevations for MCNP cells are reported at cell centroids relative to the modeled core axial midplane at 24.0 inches.

Table 13. Cycle 143B, MCNP-Calculated HGR, Neutron Flux, Depletion, and Fission Density for AFIP-3 Fuel Foils, 57.3 EFPD (EOC), Center Lobe Power at 24.9 MW (57.3 EFPD Cumulative)³

Plate ID	Cell	MCNP Cell Elevation ^(a) (inches)	Fission Power Density (W/cc)	Fission Heat Rate (W/g)	Surface Heat Flux (W/cm ²)	Neutron Flux (n/cm ² sec)	% Depletion U-235 (%)	Fission Density (fissions/cc)
3TT	A-1	20.82	8294.20	471.92	122.19	5.23E+14	20.26%	1.47E+21
	A-2	18.76	9920.13	569.57	146.14	6.59E+14	24.82%	1.83E+21
	A-3	16.70	11099.71	643.18	163.52	7.77E+14	29.12%	2.17E+21
	A-4	14.64	12113.22	707.86	178.45	8.72E+14	33.24%	2.51E+21
	A-5	12.58	12853.59	755.95	189.36	9.47E+14	36.37%	2.77E+21
	A-6	10.52	13358.64	790.58	196.80	1.01E+15	39.53%	3.04E+21
	A-7	8.46	13779.11	818.46	202.99	1.05E+15	41.37%	3.21E+21
	A-8	6.40	13775.36	820.78	202.94	1.06E+15	42.62%	3.32E+21
	A-9	4.34	13727.60	820.19	202.24	1.07E+15	43.76%	3.42E+21
	A-10	2.28	13898.80	832.59	204.76	1.08E+15	45.09%	3.54E+21
3BZ	A-11	-2.28	9812.85	757.23	214.35	1.07E+15	44.75%	2.49E+21
	A-12	-4.34	9829.74	757.13	214.72	1.08E+15	43.62%	2.43E+21
	A-13	-6.40	9739.88	748.92	212.76	1.07E+15	42.99%	2.38E+21
	A-14	-8.46	9627.91	739.10	210.31	1.06E+15	41.91%	2.32E+21
	A-15	-10.52	9438.75	722.20	206.18	1.02E+15	40.26%	2.21E+21
	A-16	-12.58	9258.64	705.14	202.25	9.84E+14	38.01%	2.07E+21
	A-17	-14.64	8822.72	668.77	192.72	9.23E+14	35.17%	1.90E+21
	A-18	-16.70	8442.39	635.82	184.42	8.41E+14	32.17%	1.72E+21
	A-19	-18.76	7612.82	568.91	166.29	7.31E+14	27.84%	1.47E+21
	A-20	-20.82	6559.87	486.07	143.29	6.01E+14	23.45%	1.23E+21
	MAX	NA	13898.80	832.59	214.72	1.08E+15	45.09%	3.54E+21
	MIN	NA	6559.87	471.92	122.19	5.23E+14	20.26%	1.23E+21
	AVG	NA	10598.30	701.02	187.83	9.21E+14	36.32%	2.38E+21

(a) Elevations for MCNP cells are reported at cell centroids relative to the modeled core axial midplane at 24.0 inches.

Table 14. Cycle 144A, MCNP-Calculated HGR and Neutron Flux for AFIP-3 Fuel Foils, 0 EFPD (BOC), Center Lobe Power at 23.1 MW³

Plate ID	Cell	MCNP Cell Elevation ^(a) (inches)	Fission Power Density (W/cc)	Fission Heat Rate (W/g)	Surface Heat Flux (W/cm ²)	Neutron Flux (n/cm ² sec)
3TT	A-1	20.82	7490.58	421.19	110.35	4.33E+14
	A-2	18.76	9411.60	532.76	138.65	5.54E+14
	A-3	16.70	10751.03	612.62	158.38	6.61E+14
	A-4	14.64	12076.08	692.41	177.90	7.59E+14
	A-5	12.58	13100.49	754.79	193.00	8.33E+14
	A-6	10.52	13831.88	800.94	203.77	9.02E+14
	A-7	8.46	14383.00	835.30	211.89	9.53E+14
	A-8	6.40	14995.88	872.62	220.92	9.79E+14
	A-9	4.34	15253.66	889.21	224.72	1.01E+15
	A-10	2.28	15624.97	912.86	230.19	1.03E+15
3BZ	A-11	-2.28	11048.71	833.27	241.35	1.03E+15
	A-12	-4.34	10834.35	815.84	236.67	1.01E+15
	A-13	-6.40	10728.60	807.15	234.36	1.01E+15
	A-14	-8.46	10585.76	795.14	231.24	9.89E+14
	A-15	-10.52	10151.07	760.64	221.74	9.49E+14
	A-16	-12.58	9735.48	727.10	212.66	8.94E+14
	A-17	-14.64	9128.78	679.03	199.41	8.26E+14
	A-18	-16.70	8291.70	614.18	181.12	7.40E+14
	A-19	-18.76	7454.68	548.79	162.84	6.37E+14
	A-20	-20.82	6248.25	457.18	136.49	5.18E+14
	MAX	NA	15624.97	912.86	241.35	1.03E+15
	MIN	NA	6248.25	421.19	110.35	4.33E+14
	AVG	NA	11056.33	718.15	196.38	8.36E+14

(a) Elevations for MCNP cells are reported at cell centroids relative to the modeled core axial midplane at 24.0 inches.

Table 15. Cycle 144A, MCNP-Calculated HGR, Neutron Flux, Depletion, and Fission Density for AFIP-3 Fuel Foils, 20.0 EFPD (MOC1), Center Lobe Power at 23.1 MW (77.3 EFPD Cumulative)³

Plate ID	Cell	MCNP Cell Elevation ^(a) (inches)	Fission Power Density (W/cc)	Fission Heat Rate (W/g)	Surface Heat Flux (W/cm ²)	Neutron Flux (n/cm ² sec)	% Depletion U-235 (%)	Fission Density (fissions/cc)
3TT	A-1	20.82	7854.16	445.50	115.71	4.68E+14	26.12%	1.91E+21
	A-2	18.76	9362.13	535.89	137.92	5.87E+14	32.10%	2.39E+21
	A-3	16.70	10664.98	615.39	157.12	6.95E+14	37.26%	2.81E+21
	A-4	14.64	11763.08	684.13	173.29	7.89E+14	42.22%	3.22E+21
	A-5	12.58	12511.73	732.11	184.32	8.59E+14	45.97%	3.54E+21
	A-6	10.52	12981.47	764.02	191.24	9.11E+14	49.51%	3.86E+21
	A-7	8.46	13465.22	795.40	198.37	9.55E+14	51.61%	4.06E+21
	A-8	6.40	13590.70	804.90	200.22	9.80E+14	53.21%	4.20E+21
	A-9	4.34	13697.15	812.91	201.79	9.97E+14	54.48%	4.32E+21
	A-10	2.28	13866.16	825.07	204.28	1.00E+15	55.97%	4.46E+21
3BZ	A-11	-2.28	9694.09	743.54	211.76	1.00E+15	55.62%	3.14E+21
	A-12	-4.34	9671.94	740.47	211.27	9.98E+14	54.35%	3.06E+21
	A-13	-6.40	9638.00	736.94	210.53	9.91E+14	53.66%	3.02E+21
	A-14	-8.46	9591.04	732.10	209.51	9.80E+14	52.46%	2.94E+21
	A-15	-10.52	9283.21	706.40	202.78	9.31E+14	50.49%	2.81E+21
	A-16	-12.58	9048.43	685.88	197.65	8.90E+14	47.93%	2.65E+21
	A-17	-14.64	8582.99	647.40	187.49	8.33E+14	44.60%	2.44E+21
	A-18	-16.70	8102.35	607.74	176.99	7.58E+14	40.87%	2.21E+21
	A-19	-18.76	7402.58	551.21	161.70	6.58E+14	35.81%	1.91E+21
	A-20	-20.82	6234.55	460.55	136.19	5.34E+14	30.29%	1.59E+21
	MAX	NA	13866.16	825.07	211.76	1.00E+15	55.97%	4.46E+21
	MIN	NA	6234.55	445.50	115.71	4.68E+14	26.12%	1.59E+21
	AVG	NA	10350.30	681.38	183.51	8.41E+14	45.73%	3.03E+21

(a) Elevations for MCNP cells are reported at cell centroids relative to the modeled core axial midplane at 24.0 inches.

Table 16. Cycle 144A, MCNP-Calculated HGR, Neutron Flux, Depletion, and Fission Density for AFIP-3 Fuel Foils, 34.8 EFPD (MOC2), Center Lobe Power at 23.1 MW (92.1 EFPD Cumulative)³

Plate ID	Cell	MCNP Cell Elevation ^(a) (inches)	Fission Power Density (W/cc)	Fission Heat Rate (W/g)	Surface Heat Flux (W/cm ²)	Neutron Flux (n/cm ² sec)	% Depletion U-235 (%)	Fission Density (fissions/cc)
3TT	A-1	20.82	8029.80	458.60	118.30	4.88E+14	30.67%	2.25E+21
	A-2	18.76	9424.12	543.90	138.84	6.10E+14	37.37%	2.79E+21
	A-3	16.70	10485.38	610.79	154.47	7.17E+14	43.14%	3.27E+21
	A-4	14.64	11204.39	658.42	165.06	8.05E+14	48.57%	3.73E+21
	A-5	12.58	11813.94	698.99	174.04	8.72E+14	52.62%	4.08E+21
	A-6	10.52	12113.84	721.19	178.46	9.32E+14	56.30%	4.42E+21
	A-7	8.46	12441.49	743.82	183.29	9.67E+14	58.55%	4.64E+21
	A-8	6.40	12339.42	739.64	181.78	9.81E+14	60.18%	4.79E+21
	A-9	4.34	12420.85	746.30	182.98	9.99E+14	61.44%	4.91E+21
	A-10	2.28	12522.45	754.38	184.48	1.00E+15	62.96%	5.06E+21
3BZ	A-11	-2.28	8852.79	686.58	193.38	1.00E+15	62.55%	3.56E+21
	A-12	-4.34	8782.56	679.81	191.85	9.92E+14	61.28%	3.48E+21
	A-13	-6.40	8791.34	679.72	192.04	9.88E+14	60.60%	3.43E+21
	A-14	-8.46	8849.31	682.97	193.30	9.78E+14	59.38%	3.35E+21
	A-15	-10.52	8691.82	668.52	189.86	9.54E+14	57.28%	3.21E+21
	A-16	-12.58	8454.58	647.55	184.68	9.06E+14	54.64%	3.04E+21
	A-17	-14.64	8213.87	625.62	179.42	8.49E+14	51.05%	2.81E+21
	A-18	-16.70	7762.38	587.74	169.56	7.77E+14	47.05%	2.56E+21
	A-19	-18.76	7111.14	534.05	155.34	6.73E+14	41.58%	2.23E+21
	A-20	-20.82	6231.93	463.64	136.13	5.51E+14	35.27%	1.86E+21
	MAX	NA	12522.45	754.38	193.38	1.00E+15	62.96%	5.06E+21
	MIN	NA	6231.93	458.60	118.30	4.88E+14	30.67%	1.86E+21
	AVG	NA	9726.87	646.61	172.36	8.52E+14	52.12%	3.47E+21

(a) Elevations for MCNP cells are reported at cell centroids relative to the modeled core axial midplane at 24.0 inches.

Table 17. Cycle 144A, MCNP-Calculated HGR, Neutron Flux, Depletion, and Fission Density for AFIP-3 Fuel Foils, 43.7 EFPD (EOC), Center Lobe Power at 23.1 MW (101.0 EFPD Cumulative)³

Plate ID	Cell	MCNP Cell Elevation ^(a) (inches)	Fission Power Density (W/cc)	Fission Heat Rate (W/g)	Surface Heat Flux (W/cm ²)	Neutron Flux (n/cm ² sec)	% Depletion U-235 (%)	Fission Density (fissions/cc)
3TT	A-1	20.82	8029.80	458.60	118.30	4.88E+14	33.49%	2.47E+21
	A-2	18.76	9424.12	543.90	138.84	6.10E+14	40.60%	3.04E+21
	A-3	16.70	10485.38	610.79	154.47	7.17E+14	46.67%	3.54E+21
	A-4	14.64	11204.39	658.42	165.06	8.05E+14	52.27%	4.02E+21
	A-5	12.58	11813.94	698.99	174.04	8.72E+14	56.44%	4.40E+21
	A-6	10.52	12113.84	721.19	178.46	9.32E+14	60.16%	4.74E+21
	A-7	8.46	12441.49	743.82	183.29	9.67E+14	62.45%	4.97E+21
	A-8	6.40	12339.42	739.64	181.78	9.81E+14	64.03%	5.11E+21
	A-9	4.34	12420.85	746.30	182.98	9.99E+14	65.28%	5.24E+21
	A-10	2.28	12522.45	754.38	184.48	1.00E+15	66.80%	5.39E+21
3BZ	A-11	-2.28	8852.79	686.58	193.38	1.00E+15	66.39%	3.80E+21
	A-12	-4.34	8782.56	679.81	191.85	9.92E+14	65.10%	3.71E+21
	A-13	-6.40	8791.34	679.72	192.04	9.88E+14	64.48%	3.66E+21
	A-14	-8.46	8849.31	682.97	193.30	9.78E+14	63.27%	3.59E+21
	A-15	-10.52	8691.82	668.52	189.86	9.54E+14	61.16%	3.44E+21
	A-16	-12.58	8454.58	647.55	184.68	9.06E+14	58.47%	3.26E+21
	A-17	-14.64	8213.87	625.62	179.42	8.49E+14	54.83%	3.03E+21
	A-18	-16.70	7762.38	587.74	169.56	7.77E+14	50.68%	2.77E+21
	A-19	-18.76	7111.14	534.05	155.34	6.73E+14	44.97%	2.42E+21
	A-20	-20.82	6231.93	463.64	136.13	5.51E+14	38.32%	2.03E+21
	MAX	NA	12522.45	754.38	193.38	1.00E+15	66.80%	5.39E+21
	MIN	NA	6231.93	458.60	118.30	4.88E+14	33.49%	2.03E+21
	AVG	NA	9726.87	646.61	172.36	8.52E+14	55.79%	3.73E+21

(a) Elevations for MCNP cells are reported at cell centroids relative to the modeled core axial midplane at 24.0 inches.

Table 18. Corrected fission power density (W/cc) and fission density (fissions/cc) for ATR Cycle 143B.

Plate ID	Cell	BOC 143B	MOC1 143B		MOC2 143B		EOC 143B	
		Fission Power Density (W/cc)	Fission Power Density (fissions/cc)	Fission Power Density (W/cc)	Fission Power Density (fissions/cc)	Fission Power Density (W/cc)	Fission Power Density (fissions/cc)	
3TT	A-1	7435.85	7936.77	3.864E+20	8563.90	8.522E+20	7575.80	1.343E+21
	A-2	9279.49	10018.19	4.823E+20	10472.23	1.069E+21	9060.91	1.671E+21
	A-3	11280.00	11850.40	5.864E+20	12229.96	1.279E+21	10138.32	1.982E+21
	A-4	13313.11	13774.80	6.914E+20	13755.23	1.498E+21	11064.04	2.293E+21
	A-5	15123.50	15039.44	7.864E+20	15010.68	1.671E+21	11740.29	2.530E+21
	A-6	16939.43	16582.57	8.805E+20	16113.01	1.854E+21	12201.59	2.777E+21
	A-7	18127.82	17400.96	9.408E+20	16847.49	1.964E+21	12585.64	2.932E+21
	A-8	18997.27	17862.34	9.865E+20	17290.01	2.037E+21	12582.22	3.032E+21
	A-9	19730.36	18681.45	1.023E+21	17472.03	2.119E+21	12538.60	3.124E+21
	A-10	20837.89	19008.50	1.087E+21	17990.27	2.201E+21	12694.97	3.233E+21
3BZ	A-11	19509.08	17886.39	1.014E+21	16655.37	2.059E+21	11885.99	3.016E+21
	A-12	18778.46	17354.79	9.763E+20	16415.87	1.999E+21	11906.45	2.943E+21
	A-13	18213.25	17218.16	9.460E+20	16180.88	1.950E+21	11797.60	2.883E+21
	A-14	17593.54	16709.55	9.145E+20	15855.30	1.890E+21	11661.98	2.810E+21
	A-15	16621.57	15988.74	8.636E+20	15244.84	1.805E+21	11432.85	2.677E+21
	A-16	15350.12	14858.58	7.982E+20	14608.52	1.672E+21	11214.69	2.507E+21
	A-17	13734.42	13831.85	7.134E+20	13513.42	1.526E+21	10686.67	2.301E+21
	A-18	12272.76	12445.18	6.383E+20	12500.22	1.369E+21	10225.99	2.083E+21
	A-19	10270.63	10618.65	5.342E+20	10911.63	1.157E+21	9221.16	1.781E+21
	A-20	8425.47	8878.41	4.385E+20	9129.71	9.581E+20	7945.76	1.490E+21

Table 19. Corrected fission power density (W/cc) and fission density (fissions/cc) for ATR Cycle 144A.

Plate ID	Cell	BOC 144A	MOC1 144A		MOC2 144A		EOC 144A	
		Fission Power Density (W/cc)	Fission Power Density (fissions/cc)	Fission Power Density (W/cc)	Fission Power Density (fissions/cc)	Fission Power Density (W/cc)	Fission Power Density (fissions/cc)	
3TT	A-1	6841.79	7173.88	1.745E+21	7334.31	2.055E+21	7334.31	2.256E+21
	A-2	8596.42	8551.24	2.183E+21	8607.86	2.548E+21	8607.86	2.777E+21
	A-3	9819.84	9741.24	2.567E+21	9577.20	2.987E+21	9577.20	3.233E+21
	A-4	11030.12	10744.23	2.941E+21	10233.93	3.407E+21	10233.93	3.672E+21
	A-5	11965.80	11428.04	3.233E+21	10790.69	3.727E+21	10790.69	4.019E+21
	A-6	12633.84	11857.09	3.526E+21	11064.61	4.037E+21	11064.61	4.329E+21
	A-7	13137.23	12298.94	3.708E+21	11363.88	4.238E+21	11363.88	4.540E+21
	A-8	13697.02	12413.55	3.836E+21	11270.65	4.375E+21	11270.65	4.667E+21
	A-9	13932.48	12510.78	3.946E+21	11345.03	4.485E+21	11345.03	4.786E+21
	A-10	14271.63	12665.15	4.074E+21	11437.83	4.622E+21	11437.83	4.923E+21
3BZ	A-11	13382.94	11742.14	3.803E+21	10723.10	4.312E+21	10723.10	4.603E+21
	A-12	13123.30	11715.31	3.706E+21	10638.03	4.215E+21	10638.03	4.494E+21
	A-13	12995.21	11674.20	3.658E+21	10648.67	4.155E+21	10648.67	4.433E+21
	A-14	12822.19	11617.32	3.561E+21	10718.88	4.058E+21	10718.88	4.348E+21
	A-15	12295.66	11244.45	3.404E+21	10528.12	3.888E+21	10528.12	4.167E+21
	A-16	11792.27	10960.07	3.210E+21	10240.76	3.682E+21	10240.76	3.949E+21
	A-17	11057.40	10396.30	2.955E+21	9949.19	3.404E+21	9949.19	3.670E+21
	A-18	10043.47	9814.11	2.677E+21	9402.32	3.101E+21	9402.32	3.355E+21
	A-19	9029.61	8966.51	2.314E+21	8613.49	2.701E+21	8613.49	2.931E+21
	A-20	7568.30	7551.71	1.926E+21	7548.53	2.253E+21	7548.53	2.459E+21

6.2 Axial Gradient

The axial gradient is represented by the neutron flux profile and the corrected fission density profile as shown in Figure 9 and Figure 10, respectively. Since the AFIP-3 experiment was irradiated in the CFT, the transverse (radial) profile is relatively flat across the plates and was not reported.

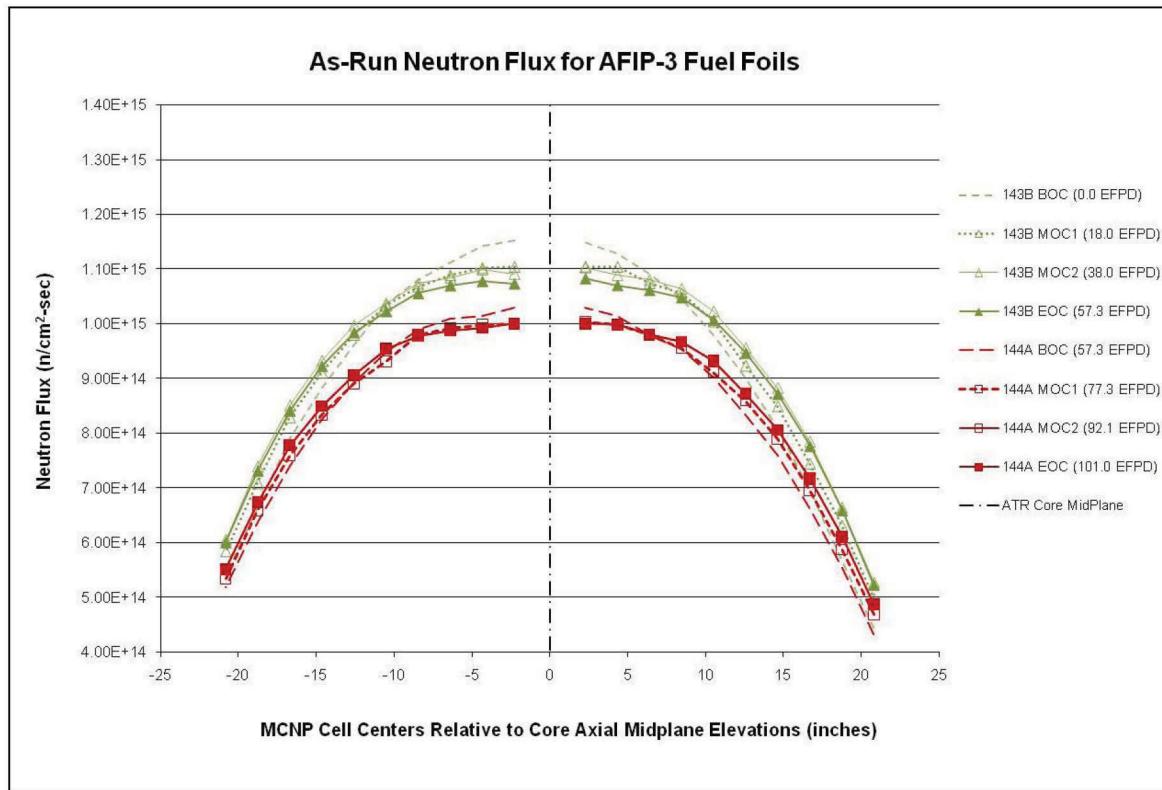


Figure 9. AFIP-3 axial neutron flux profile.³

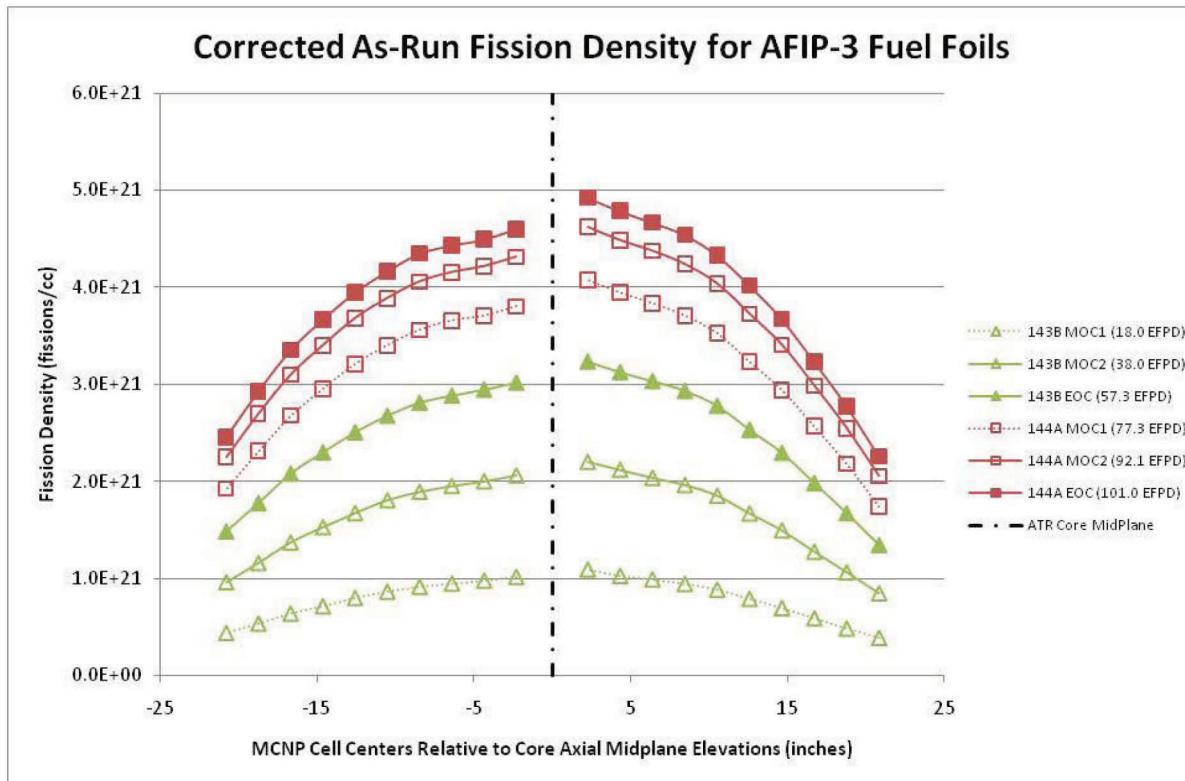


Figure 10. AFIP-3 corrected fission density axial profile.³

7. HYDRAULIC TESTING

Flow tests were performed to characterize the test assembly designed to irradiate full-size plates for the RERTR program in the ATR. The holder assembly design was used for several plate tests that were conducted in the CFT position⁶.

The test apparatus was designed and constructed to simulate the ATR CFT position geometry. The holder was fabricated such that the orifice plate on the bottom of the test train could be screwed on (rather than welded) to allow variation of the orifice diameter. The results of the flow tests were used to generate estimates of the coolant velocity and flow rate and are reported in Table 20⁶.

Table 20. AFIP irradiation vehicle flow conditions for each orifice configuration⁶.

Configuration	Total Internal Loss Coefficient	Total Holder Internal Flow (gpm)	Channel Coolant Flow (gpm)	Channel Coolant Velocity (m/s)
6 mm orifice	0.1709	20.8	6.6	1.7
7 mm orifice	0.1203	24.8	7.9	2.0
8 mm orifice	0.0869	29.2	9.3	2.4
8.1 mm orifice	0.0861	29.3	9.3	2.4
9 mm orifice	0.0680	33.0	10.5	2.7
10 mm orifice	0.0568	36.1	11.5	3.0
Open (no orifice)	0.00164	212.5	67.5	17.4

Based on the results from the hydraulic testing, the orifice was sized to 0.8125 inches (20.64 mm) to provide a coolant channel velocity of approximately 10.36 m/s for two pump operation⁷.

8. AS-RUN THERMAL ANALYSIS

The thermal as-run analysis was performed using the as-built geometry, MCNP-calculated surface heat flux (W/cm^2) and nominal coolant channel flow rate. ABAQUS⁸ was used to calculate the coolant channel temperatures and plate surface temperatures.

8.1 Coolant Channel Temperature

The coolant temperature⁹ was analyzed at the three flow channels in the test assembly. The left coolant channel is west of plate position B, the center coolant channel is in between plate positions A and B, and the Right coolant channel is in between plate position A and the Ram Rod (refer to Figure 1). For each cycle interval, the coolant temperature was plotted as a function of location along the test assembly with 0.0 inches being at the top of the assembly. These plots are show in Figure 11 through Figure 18.

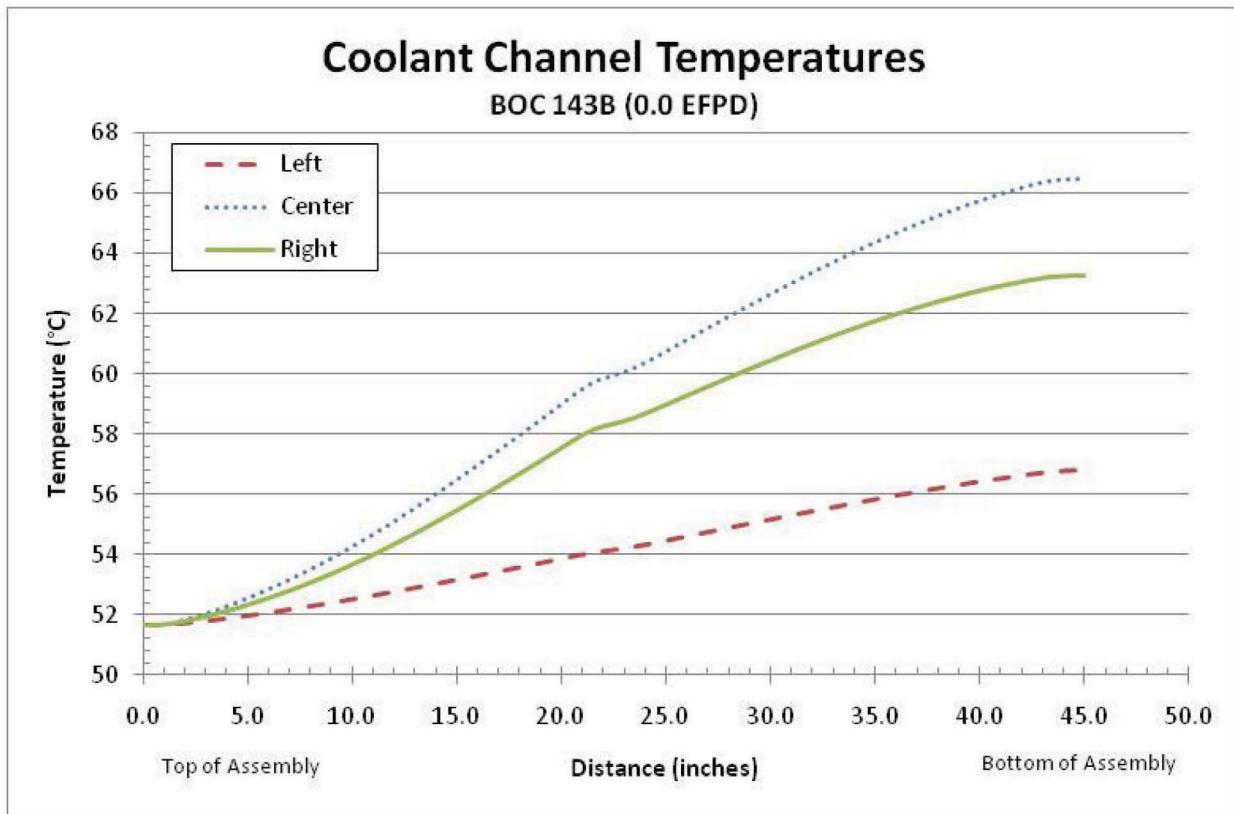


Figure 11. Coolant channel temperatures as a function of location along the test assembly at BOC 143B (0.0 EFPD).

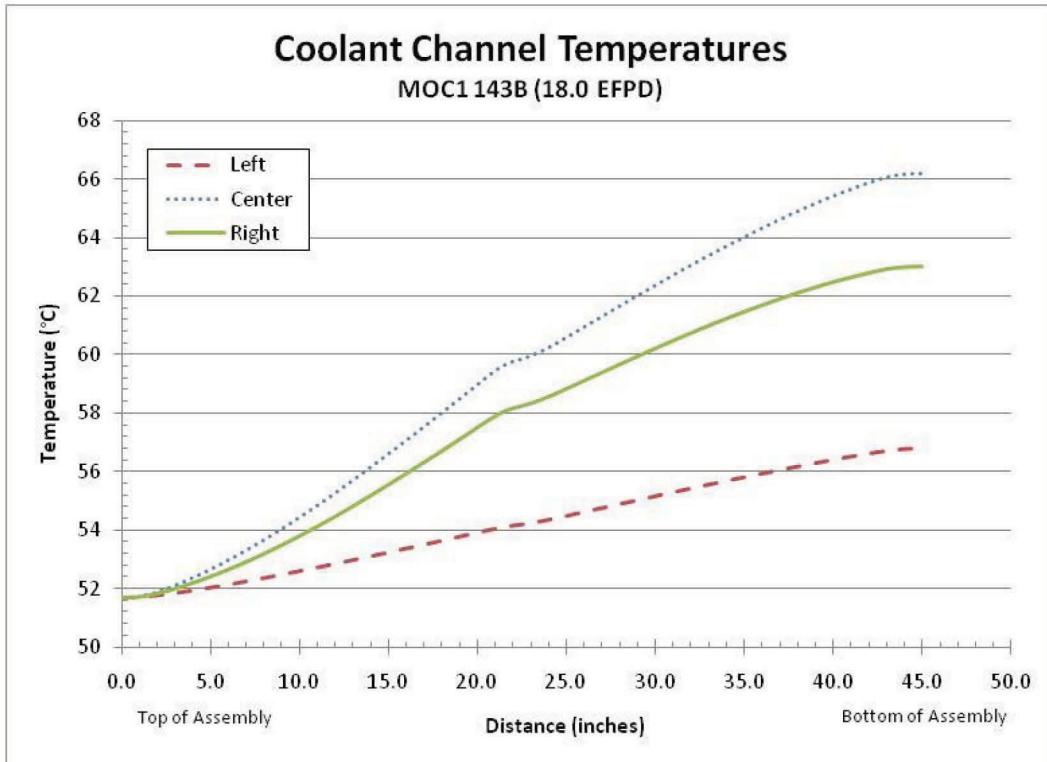


Figure 12. Coolant channel temperatures as a function of location along the test assembly at MOC1 143B (18.0 EFPD).

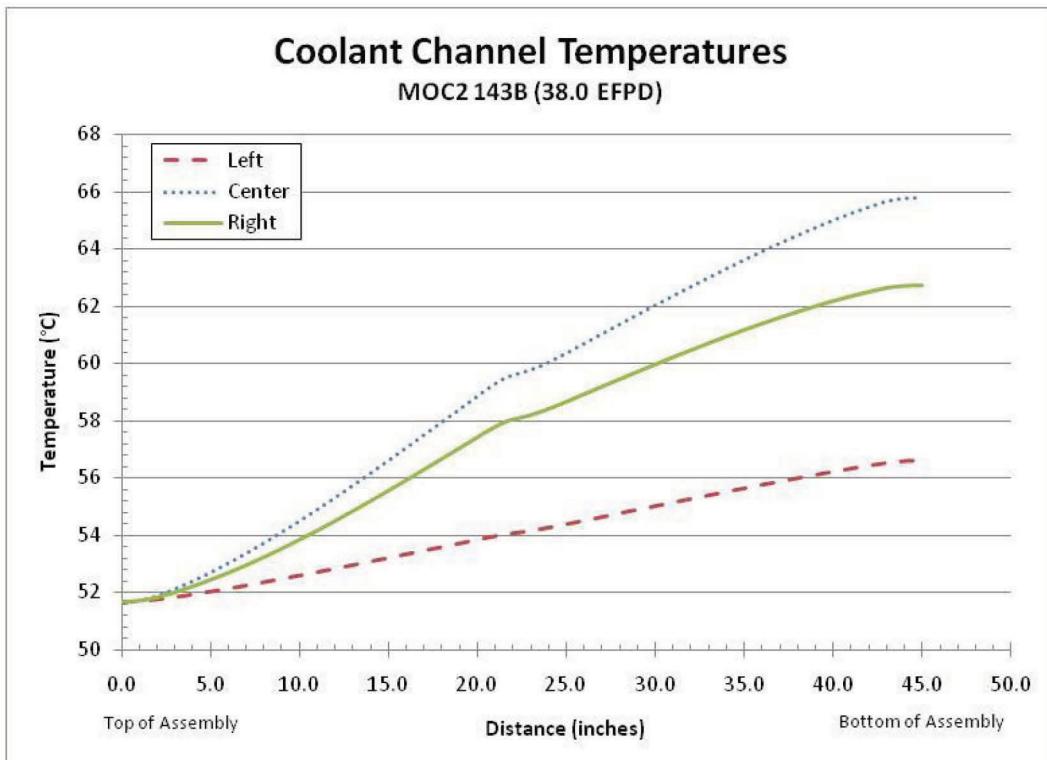


Figure 13. Coolant channel temperatures as a function of location along the test assembly at MOC2 143B (38.0 EFPD).

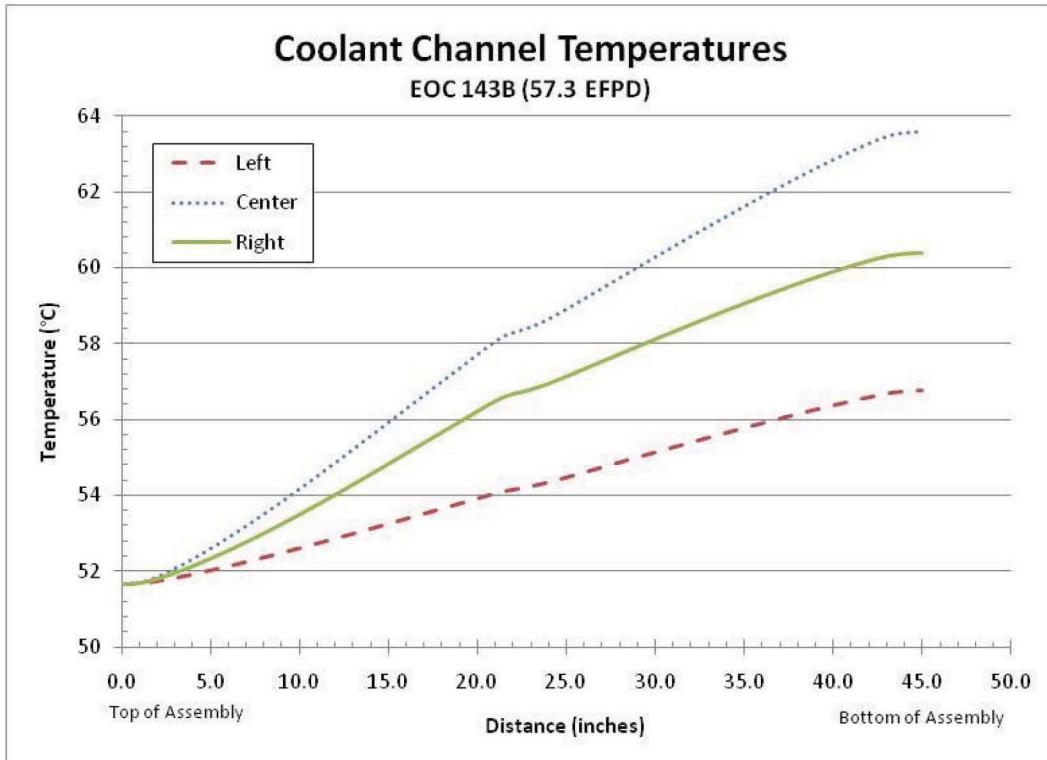


Figure 14. Coolant channel temperatures as a function of location along the test assembly at EOC 143B (57.3 EFPD).

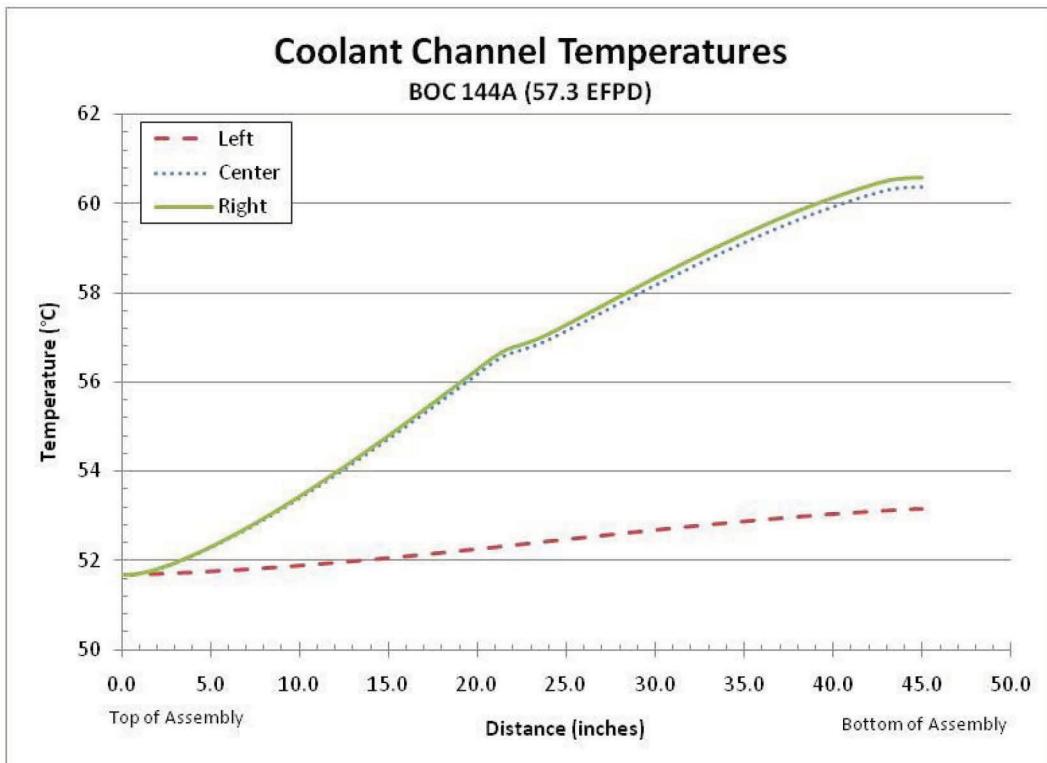


Figure 15. Coolant channel temperatures as a function of location along the test assembly at BOC 144A (57.3 EFPD).

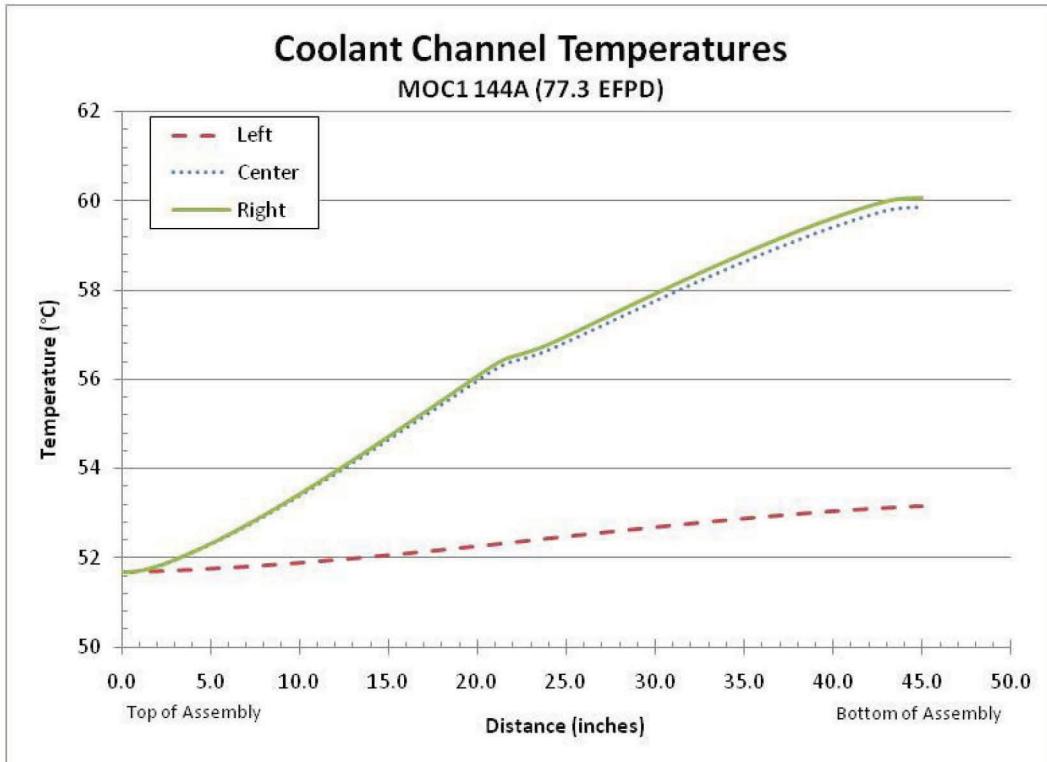


Figure 16. Coolant channel temperatures as a function of location along the test assembly at MOC1 144A (77.3 EFPD).

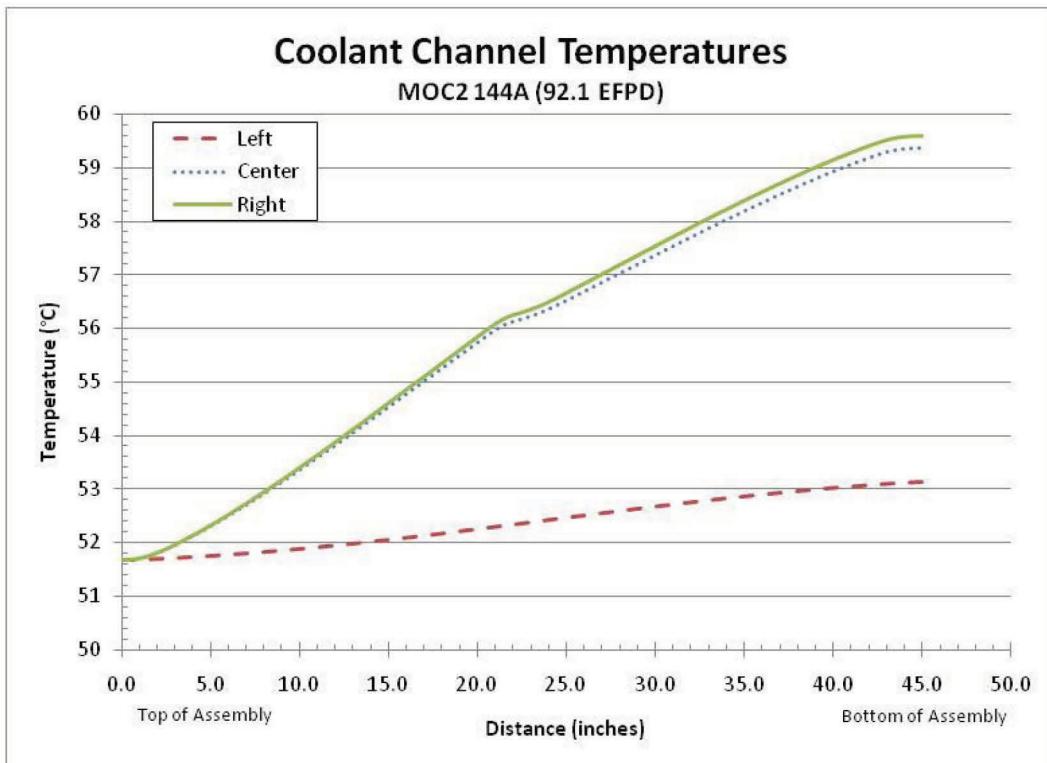


Figure 17. Coolant channel temperatures as a function of location along the test assembly at MOC2 143B (92.1 EFPD).

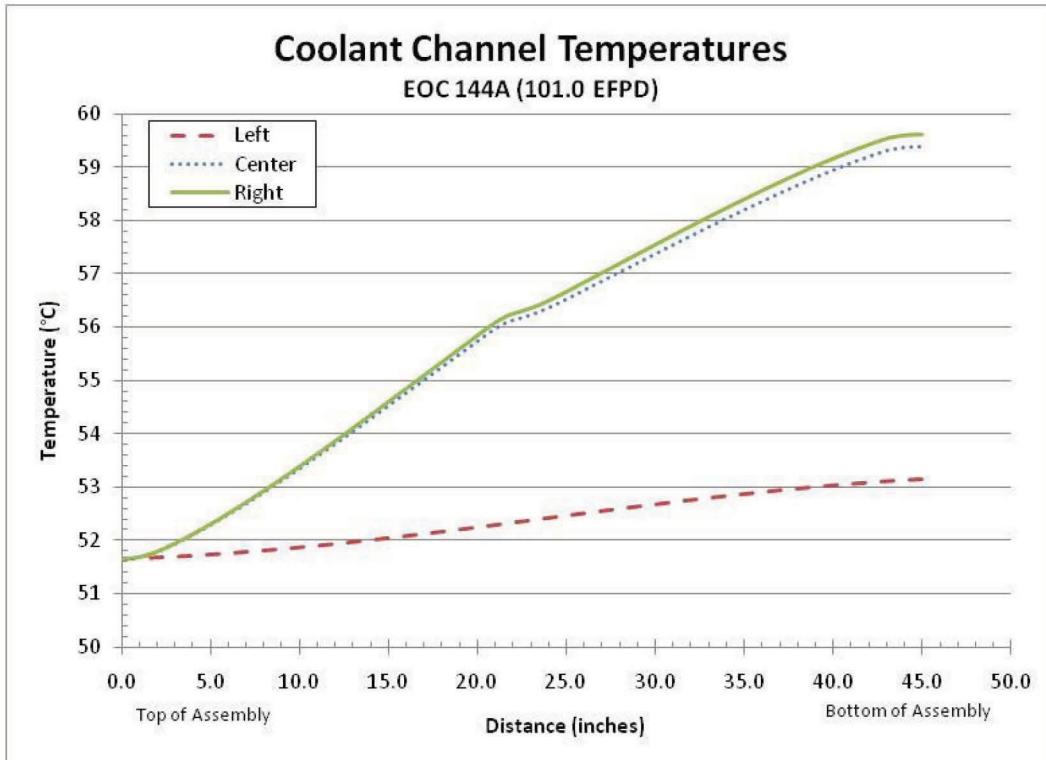


Figure 18. Coolant channel temperatures as a function of location along the test assembly at EOC 144A (101.0 EFPD).

8.2 Plate Surface Temperature

The plate surface temperatures⁹ were analyzed at each time step for each side of the plate, with the east side of the plate facing the ram rod and west side of the plate facing plate position B. Table 21 through Table 28 tabulate the 2D map of the temperatures for each side of the plate at EOC for each cycle. The plate surface temperatures for each time step are tabulated in Appendix B.

Table 21. Temperature (°C) map of the east side of plate 3TT at EOC 143B (57.3 EFPD).

Length of Plate (in)	Width of Plate (inches)									
	0.05	0.25	0.50	0.75	1.00	1.25	1.50	1.75	2.00	2.24
0.125	51.94	51.78	51.77	51.77	51.77	51.77	51.77	51.77	51.80	51.94
1.00	53.01	52.49	52.67	52.69	52.69	52.69	52.68	52.61	52.44	52.91
2.00	57.00	81.51	84.50	84.57	84.57	84.57	84.56	84.30	71.15	55.60
3.00	57.37	81.77	84.79	84.86	84.87	84.87	84.85	84.58	71.44	55.94
4.00	58.32	86.85	90.27	90.35	90.36	90.36	90.35	90.04	74.94	56.65
5.00	58.59	87.04	90.46	90.55	90.56	90.56	90.54	90.23	75.15	56.91
6.00	59.36	90.67	94.37	94.46	94.47	94.47	94.45	94.12	77.70	57.47
7.00	59.66	90.87	94.58	94.67	94.69	94.69	94.66	94.33	77.93	57.75
8.00	60.37	93.94	97.87	97.97	97.99	97.99	97.96	97.61	80.12	58.29
9.00	60.63	94.12	98.05	98.16	98.18	98.17	98.14	97.79	80.34	58.61
10.00	61.20	96.38	100.57	100.69	100.72	100.71	100.67	100.26	81.97	59.04
11.00	61.49	96.59	100.81	100.95	100.97	100.97	100.92	100.50	82.20	59.29
12.00	61.97	98.18	102.64	102.79	102.81	102.81	102.76	102.32	83.38	59.68
13.00	62.23	98.36	102.86	103.01	103.04	103.04	102.98	102.54	83.61	59.95
14.00	62.65	99.79	104.41	104.57	104.60	104.60	104.53	104.08	84.62	60.30
15.00	62.90	100.01	104.63	104.80	104.83	104.83	104.76	104.30	84.83	60.52
16.00	63.17	100.25	104.87	105.04	105.08	105.07	105.00	104.53	85.05	60.75
17.00	63.40	100.46	105.08	105.26	105.30	105.30	105.21	104.74	85.28	61.04
18.00	63.61	100.53	105.15	105.33	105.37	105.37	105.28	104.80	85.40	61.27
19.00	63.83	100.74	105.36	105.54	105.59	105.59	105.50	105.01	85.60	61.47
20.00	64.15	101.47	106.14	106.33	106.37	106.37	106.27	105.78	86.14	61.70
21.00	64.34	101.66	106.33	106.52	106.57	106.57	106.47	105.97	86.33	61.89
22.00	59.42	62.86	64.20	64.37	64.43	64.42	64.30	63.89	60.93	58.77
22.50	57.81	57.46	57.68	57.82	57.88	57.87	57.75	57.56	57.40	57.61

Table 22. Temperature (°C) map of the west side of plate 3TT at EOC 143B (57.3 EFPD).

Length of Plate (in)	Width of Plate (inches)									
	0.05	0.25	0.50	0.75	1.00	1.25	1.50	1.75	2.00	2.24
0.125	51.98	51.78	51.77	51.77	51.77	51.77	51.77	51.77	51.80	51.97
1.00	53.22	52.50	52.67	52.69	52.69	52.69	52.69	52.61	52.44	53.03
2.00	57.75	81.52	84.51	84.58	84.58	84.58	84.57	84.31	71.15	55.94
3.00	58.16	81.81	84.82	84.89	84.90	84.90	84.89	84.61	71.45	56.31
4.00	59.22	86.91	90.33	90.41	90.42	90.42	90.40	90.10	74.98	57.07
5.00	59.52	87.13	90.54	90.63	90.64	90.64	90.62	90.31	75.21	57.34
6.00	60.37	90.78	94.48	94.57	94.58	94.58	94.56	94.23	77.79	57.93
7.00	60.70	91.03	94.72	94.82	94.84	94.83	94.81	94.47	78.05	58.21
8.00	61.49	94.13	98.05	98.15	98.17	98.17	98.14	97.79	80.27	58.77
9.00	61.77	94.34	98.26	98.37	98.39	98.39	98.35	98.00	80.52	59.18
10.00	62.39	96.63	100.85	100.98	101.00	101.00	100.95	100.55	82.19	59.60
11.00	62.71	96.88	101.14	101.27	101.30	101.30	101.25	100.83	82.45	59.84
12.00	63.23	98.52	103.00	103.15	103.18	103.18	103.12	102.69	83.66	60.24
13.00	63.51	98.78	103.26	103.42	103.45	103.44	103.38	102.94	83.91	60.52
14.00	63.96	100.25	104.85	105.01	105.04	105.04	104.97	104.52	84.95	60.89
15.00	64.24	100.51	105.12	105.28	105.31	105.31	105.24	104.78	85.20	61.10
16.00	64.53	100.79	105.39	105.56	105.60	105.60	105.52	105.05	85.46	61.32
17.00	64.78	101.04	105.65	105.82	105.86	105.86	105.78	105.31	85.72	61.69
18.00	65.00	101.16	105.76	105.94	105.98	105.97	105.89	105.41	85.87	61.95
19.00	65.24	101.41	106.01	106.19	106.23	106.23	106.14	105.66	86.11	62.13
20.00	65.58	102.18	106.82	107.01	107.06	107.06	106.96	106.47	86.68	62.33
21.00	65.79	102.41	107.05	107.24	107.29	107.29	107.19	106.69	86.90	62.51
22.00	60.30	63.47	64.80	64.97	65.02	65.02	64.90	64.49	61.54	59.17
22.50	58.53	58.10	58.31	58.44	58.50	58.49	58.38	58.19	58.02	57.99

Table 23. Temperature (°C) map of the east side of plate 3BZ at EOC 143B (57.3 EFPD).

Length of Plate (in)	Width of Plate (inches)									
	0.05	0.25	0.50	0.75	1.00	1.25	1.50	1.75	2.00	2.24
0.125	57.92	57.49	57.72	57.85	57.92	57.91	57.79	57.60	57.43	57.71
1.00	59.07	61.36	62.37	62.53	62.59	62.59	62.47	62.12	59.97	58.55
2.00	62.91	90.09	93.46	93.63	93.68	93.67	93.57	93.19	78.70	61.08
3.00	63.10	90.30	93.67	93.84	93.89	93.89	93.79	93.39	78.92	61.27
4.00	63.26	90.50	93.88	94.05	94.11	94.10	94.00	93.60	79.13	61.47
5.00	63.40	90.65	94.03	94.21	94.26	94.26	94.15	93.75	79.29	61.62
6.00	63.50	90.54	93.89	94.08	94.13	94.13	94.02	93.61	79.27	61.71
7.00	63.64	90.70	94.06	94.24	94.30	94.29	94.18	93.77	79.43	61.81
8.00	63.71	90.52	93.85	94.04	94.10	94.09	93.97	93.57	79.36	61.89
9.00	63.82	90.65	93.99	94.18	94.23	94.22	94.11	93.71	79.51	62.02
10.00	63.85	90.24	93.53	93.72	93.78	93.78	93.66	93.25	79.29	62.07
11.00	63.95	90.40	93.68	93.88	93.93	93.93	93.81	93.40	79.44	62.14
12.00	63.97	90.01	93.25	93.44	93.51	93.50	93.38	92.97	79.23	62.19
13.00	64.05	90.14	93.38	93.58	93.64	93.63	93.51	93.10	79.37	62.30
14.00	63.92	88.99	92.12	92.32	92.38	92.38	92.25	91.84	78.64	62.26
15.00	63.99	89.12	92.26	92.46	92.53	92.52	92.39	91.98	78.77	62.30
16.00	63.88	88.12	91.16	91.36	91.43	91.42	91.29	90.89	78.14	62.21
17.00	63.92	88.23	91.28	91.48	91.55	91.54	91.40	91.00	78.25	62.24
18.00	63.60	85.88	88.70	88.89	88.96	88.96	88.82	88.43	76.71	62.06
19.00	63.60	85.97	88.79	88.99	89.06	89.05	88.91	88.52	76.80	62.06
20.00	63.14	82.88	85.42	85.62	85.69	85.69	85.54	85.17	74.77	61.74
21.00	63.11	82.95	85.49	85.68	85.76	85.75	85.61	85.24	74.83	61.71
22.00	60.20	61.43	61.87	62.07	62.15	62.15	61.98	61.70	61.05	59.78
22.50	59.66	60.96	61.26	61.45	61.53	61.52	61.36	61.14	60.67	59.34

Table 24. Temperature (°C) map of the west side of plate 3BZ at EOC 143B (57.3 EFPD).

Length of Plate (in)	Width of Plate (inches)									
	0.05	0.25	0.50	0.75	1.00	1.25	1.50	1.75	2.00	2.24
0.125	58.61	58.14	58.35	58.48	58.54	58.53	58.42	58.23	58.06	58.06
1.00	59.93	61.99	63.00	63.15	63.21	63.21	63.09	62.74	60.59	58.94
2.00	64.29	90.86	94.19	94.37	94.42	94.42	94.31	93.94	79.38	61.70
3.00	64.50	91.09	94.46	94.64	94.69	94.69	94.58	94.17	79.62	61.90
4.00	64.67	91.33	94.72	94.90	94.96	94.95	94.84	94.42	79.86	62.16
5.00	64.82	91.51	94.92	95.10	95.16	95.16	95.04	94.63	80.06	62.34
6.00	64.94	91.44	94.83	95.01	95.07	95.07	94.95	94.53	80.07	62.41
7.00	65.09	91.63	95.05	95.24	95.30	95.29	95.17	94.75	80.26	62.47
8.00	65.16	91.49	94.88	95.07	95.13	95.13	95.00	94.58	80.23	62.55
9.00	65.28	91.66	95.07	95.26	95.32	95.32	95.20	94.77	80.41	62.69
10.00	65.31	91.29	94.65	94.84	94.90	94.90	94.77	94.35	80.22	62.74
11.00	65.42	91.48	94.86	95.05	95.12	95.11	94.98	94.56	80.41	62.80
12.00	65.45	91.13	94.45	94.65	94.72	94.71	94.58	94.16	80.23	62.86
13.00	65.53	91.30	94.64	94.84	94.90	94.90	94.77	94.34	80.40	63.01
14.00	65.39	90.20	93.39	93.59	93.65	93.65	93.51	93.09	79.71	62.99
15.00	65.45	90.37	93.58	93.78	93.85	93.85	93.71	93.29	79.88	63.01
16.00	65.34	89.42	92.50	92.70	92.77	92.76	92.62	92.21	79.28	62.88
17.00	65.38	89.56	92.66	92.87	92.94	92.93	92.79	92.37	79.42	62.90
18.00	65.01	87.26	90.07	90.27	90.34	90.33	90.19	89.80	77.93	62.71
19.00	65.01	87.39	90.20	90.40	90.48	90.47	90.32	89.93	78.05	62.72
20.00	64.50	84.36	86.90	87.09	87.16	87.15	87.01	86.64	76.07	62.35
21.00	64.46	84.46	87.00	87.19	87.26	87.25	87.11	86.74	76.15	62.32
22.00	61.06	62.70	63.15	63.34	63.42	63.41	63.25	62.97	62.29	60.19
22.50	60.43	62.24	62.55	62.73	62.81	62.80	62.64	62.41	61.92	59.71

Table 25. Temperature (°C) map of the east side of plate 3TT at EOC 144A (101.0 EFPD).

Length of Plate (in)	Width of Plate (inches)									
	0.05	0.25	0.50	0.75	1.00	1.25	1.50	1.75	2.00	2.24
0.125	51.92	51.77	51.76	51.76	51.76	51.76	51.76	51.76	51.79	51.92
1.00	52.88	52.45	52.63	52.65	52.65	52.65	52.65	52.57	52.38	52.78
2.00	56.54	80.64	83.58	83.65	83.65	83.65	83.64	83.38	70.48	55.14
3.00	56.86	80.88	83.85	83.92	83.93	83.93	83.91	83.64	70.74	55.44
4.00	57.65	85.29	88.61	88.69	88.70	88.70	88.68	88.39	73.76	56.01
5.00	57.89	85.46	88.78	88.87	88.88	88.87	88.86	88.55	73.94	56.24
6.00	58.56	88.76	92.35	92.44	92.45	92.45	92.43	92.10	76.25	56.73
7.00	58.82	88.94	92.53	92.63	92.64	92.64	92.61	92.28	76.45	56.97
8.00	59.36	91.18	94.94	95.04	95.05	95.05	95.03	94.69	78.05	57.37
9.00	59.58	91.34	95.10	95.20	95.22	95.22	95.19	94.84	78.24	57.64
10.00	60.07	93.25	97.14	97.25	97.26	97.26	97.23	96.87	79.62	58.01
11.00	60.32	93.43	97.32	97.44	97.45	97.45	97.41	97.05	79.81	58.23
12.00	60.67	94.43	98.39	98.51	98.53	98.53	98.49	98.12	80.58	58.52
13.00	60.88	94.59	98.56	98.68	98.71	98.71	98.65	98.28	80.76	58.74
14.00	61.23	95.68	99.79	99.94	99.96	99.96	99.90	99.48	81.57	59.04
15.00	61.45	95.84	99.99	100.13	100.16	100.16	100.10	99.67	81.75	59.22
16.00	61.63	95.74	99.87	100.02	100.05	100.05	99.98	99.55	81.75	59.39
17.00	61.83	95.90	100.05	100.21	100.24	100.24	100.17	99.73	81.94	59.64
18.00	62.05	96.28	100.50	100.66	100.70	100.69	100.62	100.17	82.28	59.86
19.00	62.25	96.45	100.68	100.85	100.89	100.89	100.81	100.35	82.45	60.03
20.00	62.49	96.91	101.21	101.39	101.43	101.43	101.34	100.88	82.84	60.23
21.00	62.66	97.05	101.37	101.55	101.60	101.60	101.50	101.04	82.99	60.38
22.00	58.33	61.48	62.71	62.86	62.91	62.91	62.80	62.43	59.72	57.73
22.50	56.94	56.53	56.72	56.83	56.88	56.88	56.78	56.61	56.50	56.75

Table 26. Temperature (°C) map of the west side of plate 3TT at EOC 144A (101.0 EFPD).

Length of Plate (in)	Width of Plate (inches)									
	0.05	0.25	0.50	0.75	1.00	1.25	1.50	1.75	2.00	2.24
0.125	51.95	51.77	51.76	51.76	51.76	51.76	51.76	51.76	51.79	51.95
1.00	53.00	52.45	52.63	52.65	52.65	52.65	52.65	52.57	52.38	52.84
2.00	56.86	80.64	83.58	83.65	83.65	83.65	83.64	83.38	70.47	55.23
3.00	57.19	80.88	83.85	83.92	83.92	83.92	83.91	83.64	70.73	55.53
4.00	58.03	85.29	88.61	88.69	88.69	88.69	88.68	88.39	73.75	56.13
5.00	58.28	85.46	88.78	88.86	88.87	88.87	88.85	88.55	73.94	56.36
6.00	58.99	88.76	92.34	92.43	92.44	92.44	92.42	92.10	76.24	56.85
7.00	59.26	88.95	92.53	92.62	92.63	92.63	92.61	92.28	76.44	57.08
8.00	59.82	91.19	94.94	95.03	95.04	95.04	95.02	94.69	78.05	57.49
9.00	60.06	91.35	95.09	95.19	95.21	95.20	95.18	94.84	78.24	57.82
10.00	60.57	93.25	97.13	97.24	97.25	97.25	97.22	96.87	79.61	58.18
11.00	60.83	93.44	97.31	97.42	97.44	97.43	97.40	97.05	79.81	58.38
12.00	61.20	94.44	98.39	98.50	98.51	98.51	98.48	98.12	80.58	58.67
13.00	61.42	94.61	98.55	98.66	98.68	98.68	98.64	98.28	80.76	58.90
14.00	61.78	95.69	99.78	99.91	99.94	99.93	99.89	99.48	81.58	59.20
15.00	62.00	95.86	99.97	100.11	100.13	100.13	100.08	99.67	81.76	59.38
16.00	62.19	95.75	99.85	99.99	100.02	100.02	99.96	99.55	81.76	59.53
17.00	62.39	95.91	100.04	100.18	100.21	100.20	100.15	99.73	81.95	59.83
18.00	62.62	96.30	100.48	100.63	100.66	100.65	100.59	100.17	82.29	60.07
19.00	62.82	96.46	100.66	100.82	100.85	100.84	100.78	100.35	82.46	60.24
20.00	63.07	96.93	101.20	101.35	101.38	101.38	101.31	100.88	82.85	60.39
21.00	63.24	97.07	101.36	101.51	101.55	101.54	101.47	101.04	83.01	60.54
22.00	58.69	61.50	62.70	62.83	62.87	62.86	62.78	62.42	59.74	57.86
22.50	57.28	56.55	56.71	56.80	56.84	56.83	56.75	56.61	56.53	56.94

Table 27. Temperature (°C) map of the east side of plate 3BZ at EOC 144A (101.0 EFPD).

Length of Plate (in)	Width of Plate (inches)									
	0.05	0.25	0.50	0.75	1.00	1.25	1.50	1.75	2.00	2.24
0.125	57.03	56.56	56.75	56.87	56.92	56.91	56.81	56.64	56.53	56.84
1.00	58.00	60.09	61.03	61.17	61.22	61.21	61.11	60.80	58.83	57.52
2.00	61.32	86.64	89.80	89.96	90.00	90.00	89.91	89.54	75.98	59.62
3.00	61.47	86.79	89.96	90.11	90.16	90.16	90.06	89.69	76.15	59.77
4.00	61.56	86.73	89.88	90.04	90.09	90.09	89.99	89.62	76.17	59.90
5.00	61.68	86.86	90.01	90.17	90.22	90.22	90.12	89.75	76.30	60.02
6.00	61.79	87.01	90.16	90.32	90.37	90.37	90.27	89.90	76.45	60.11
7.00	61.90	87.15	90.30	90.46	90.51	90.51	90.41	90.03	76.58	60.19
8.00	62.02	87.44	90.60	90.77	90.82	90.82	90.71	90.34	76.82	60.30
9.00	62.10	87.55	90.72	90.89	90.94	90.94	90.83	90.45	76.94	60.39
10.00	62.11	87.20	90.33	90.50	90.55	90.55	90.44	90.06	76.75	60.42
11.00	62.18	87.33	90.45	90.63	90.68	90.68	90.57	90.19	76.87	60.47
12.00	62.15	86.73	89.80	89.97	90.03	90.02	89.91	89.53	76.51	60.47
13.00	62.20	86.84	89.90	90.08	90.14	90.13	90.02	89.64	76.62	60.54
14.00	62.14	86.22	89.23	89.41	89.46	89.46	89.35	88.97	76.25	60.53
15.00	62.18	86.34	89.34	89.52	89.58	89.58	89.46	89.08	76.35	60.56
16.00	62.02	85.08	87.97	88.15	88.21	88.20	88.09	87.71	75.53	60.44
17.00	62.04	85.17	88.06	88.24	88.30	88.30	88.18	87.80	75.62	60.45
18.00	61.77	83.27	86.00	86.18	86.24	86.24	86.11	85.74	74.39	60.29
19.00	61.76	83.35	86.07	86.25	86.31	86.31	86.19	85.82	74.46	60.28
20.00	61.37	80.71	83.19	83.37	83.44	83.43	83.31	82.95	72.73	60.02
21.00	61.33	80.76	83.25	83.43	83.49	83.49	83.36	83.01	72.78	59.98
22.00	58.70	59.72	60.12	60.28	60.36	60.35	60.21	59.96	59.40	58.31
22.50	58.23	59.26	59.51	59.66	59.73	59.72	59.59	59.40	59.04	57.93

Table 28. Temperature (°C) map of the west side of plate 3BZ at EOC 144A (101.0 EFPD).

Length of Plate (in)	Width of Plate (inches)									
	0.05	0.25	0.50	0.75	1.00	1.25	1.50	1.75	2.00	2.24
0.125	57.33	56.58	56.74	56.83	56.87	56.87	56.78	56.64	56.56	56.99
1.00	58.34	60.11	61.01	61.13	61.17	61.17	61.08	60.79	58.85	57.64
2.00	61.82	86.66	89.78	89.92	89.95	89.94	89.88	89.54	76.00	59.77
3.00	61.96	86.81	89.93	90.07	90.10	90.10	90.03	89.69	76.16	59.91
4.00	62.05	86.75	89.86	89.99	90.03	90.02	89.95	89.61	76.18	60.08
5.00	62.16	86.88	89.99	90.12	90.16	90.15	90.08	89.74	76.32	60.21
6.00	62.27	87.02	90.13	90.27	90.31	90.30	90.23	89.88	76.46	60.28
7.00	62.37	87.16	90.27	90.41	90.44	90.44	90.37	90.02	76.59	60.33
8.00	62.48	87.45	90.57	90.71	90.75	90.74	90.67	90.32	76.83	60.42
9.00	62.55	87.57	90.69	90.83	90.87	90.86	90.79	90.44	76.96	60.52
10.00	62.55	87.21	90.30	90.44	90.48	90.47	90.39	90.05	76.76	60.54
11.00	62.61	87.34	90.42	90.56	90.60	90.60	90.52	90.17	76.88	60.58
12.00	62.56	86.74	89.77	89.91	89.95	89.94	89.86	89.52	76.52	60.58
13.00	62.60	86.85	89.87	90.01	90.05	90.05	89.97	89.62	76.63	60.67
14.00	62.53	86.23	89.20	89.34	89.38	89.37	89.29	88.95	76.25	60.66
15.00	62.55	86.34	89.31	89.45	89.49	89.49	89.40	89.06	76.36	60.67
16.00	62.36	85.08	87.93	88.07	88.12	88.11	88.03	87.69	75.54	60.52
17.00	62.36	85.17	88.02	88.16	88.21	88.20	88.12	87.78	75.63	60.51
18.00	62.07	83.28	85.96	86.10	86.14	86.14	86.05	85.72	74.40	60.35
19.00	62.04	83.35	86.03	86.18	86.22	86.21	86.13	85.79	74.46	60.34
20.00	61.61	80.71	83.15	83.29	83.34	83.33	83.24	82.92	72.74	60.05
21.00	61.55	80.77	83.21	83.35	83.39	83.39	83.30	82.98	72.78	60.01
22.00	58.77	59.72	60.08	60.22	60.27	60.26	60.15	59.94	59.41	58.32
22.50	58.28	59.26	59.47	59.59	59.65	59.64	59.53	59.37	59.05	57.93

9. REFERENCES

1. D.M. Wachs, “RERTR Fuel Development and Qualification Plan,” INL/EXT-05-01017, Revision 4, August 2009.
2. “Experiment Control Plan for the AFIP-3 Fuel Irradiation in the ATR,” PLN-2689, January 2008.
3. M. A. Lillo, G. S. Chang. “As-Run Neutronic Analysis for the AFIP-3 Experiment Irradiated in the Center Flux Trap of the ATR, Cycles 143B and 144A,” ECAR-1441. March 2011.
4. RERTR Project Personnel, “RERTR AFIP-3 Irradiation Experiment in the Advanced Test Reactor: As-Built Data Package,” AFIP-3, March 2008.
5. G. A. Moore, “Fuel Loading Calculations for AFIP-3 Irradiation Experiment,” ECAR-464, November 2008.
6. D.M. Wachs, “Hydraulic Testing of the AFIP Irradiation Vehicle for the ATR Center Flux Trap Position,” ECAR-99. October 2007.
7. R. G. Ambrosek, “RELAP Analysis for AFIP-2 Flow Resistor,” ECAR-126, January 2008.
8. P. E. Murray, “Validation of ABAQUS Standard 6.7-3 Heat Transfer”, ECAR-131, January 2008.
9. G. A. Roth, “AFIP-3 Thermal As-Run Analysis Results,” GAR-02-11, April 2011.

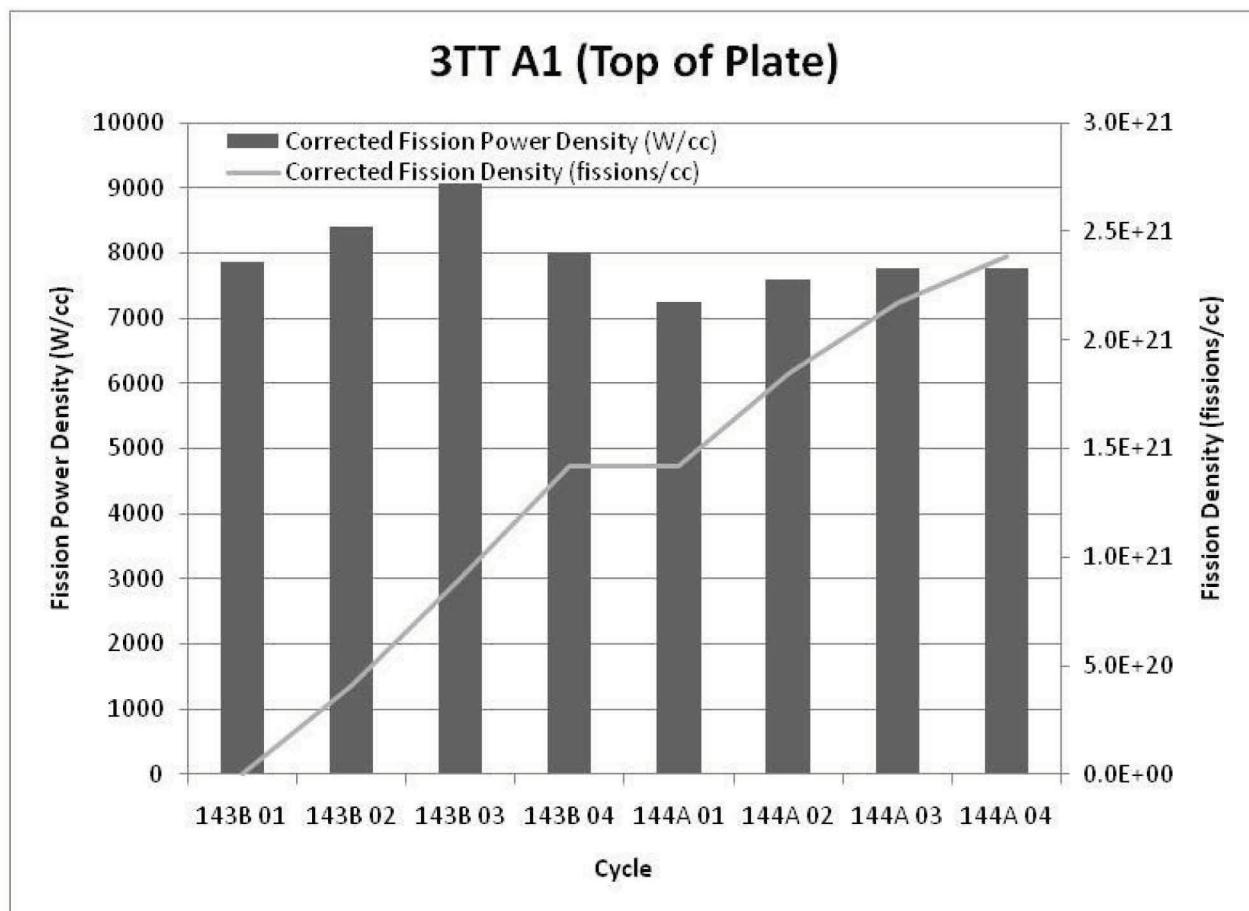
Appendix A

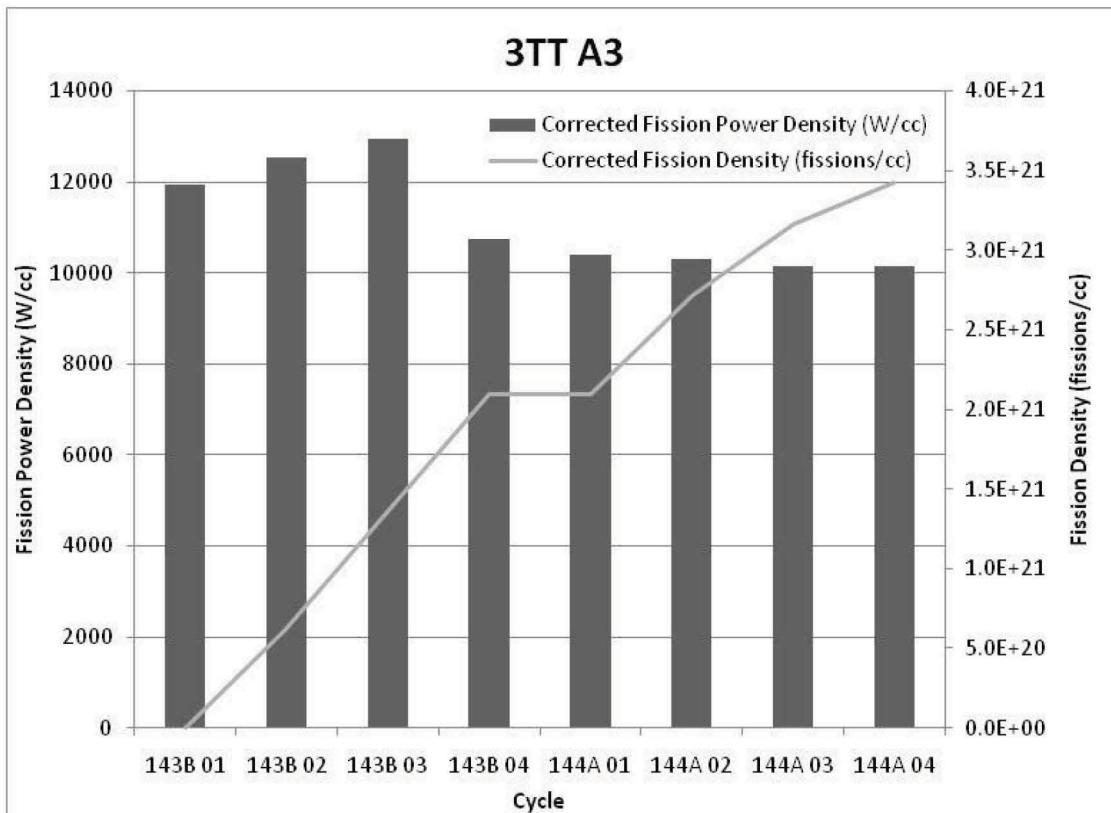
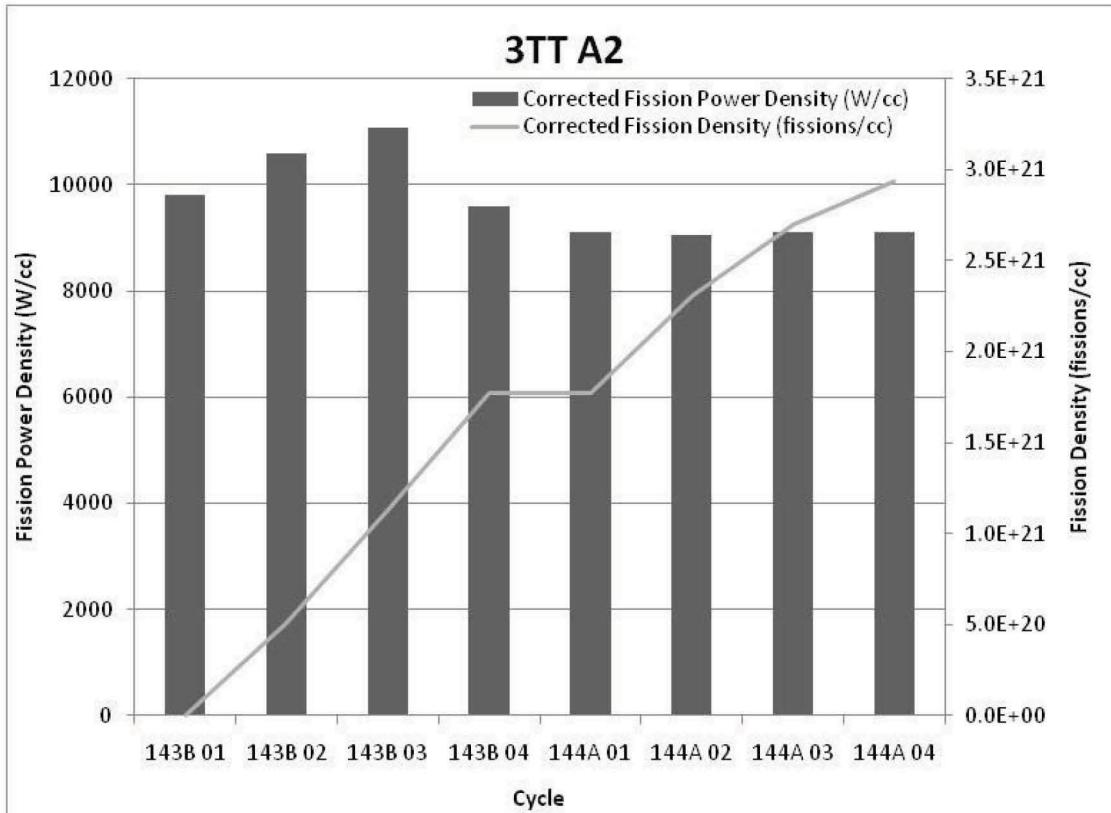
Individual Plate Power and Fission Density Plots

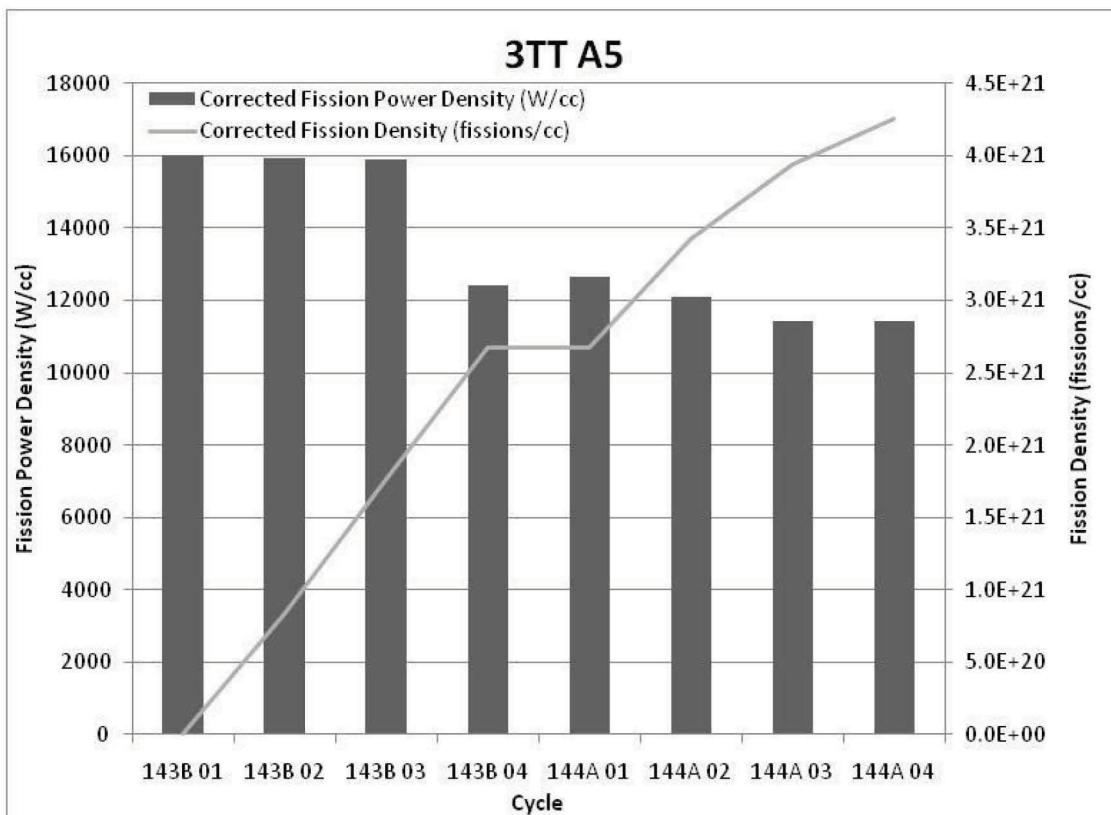
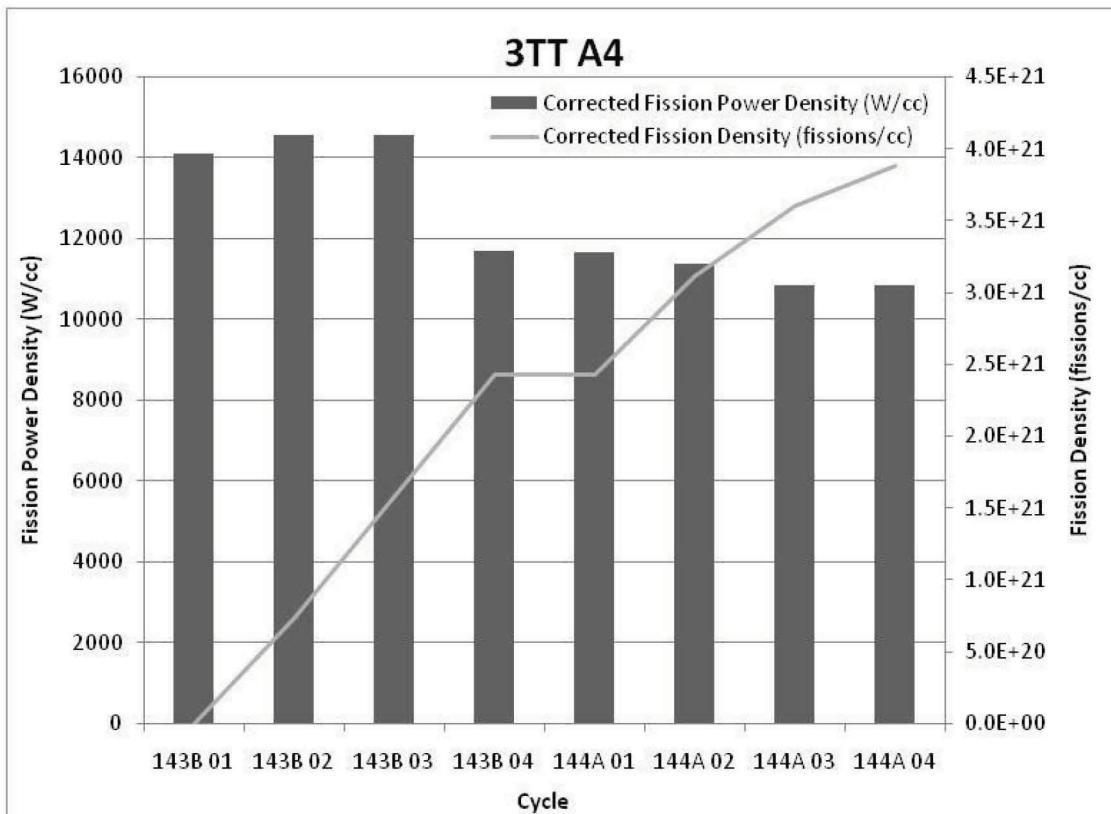
Appendix A

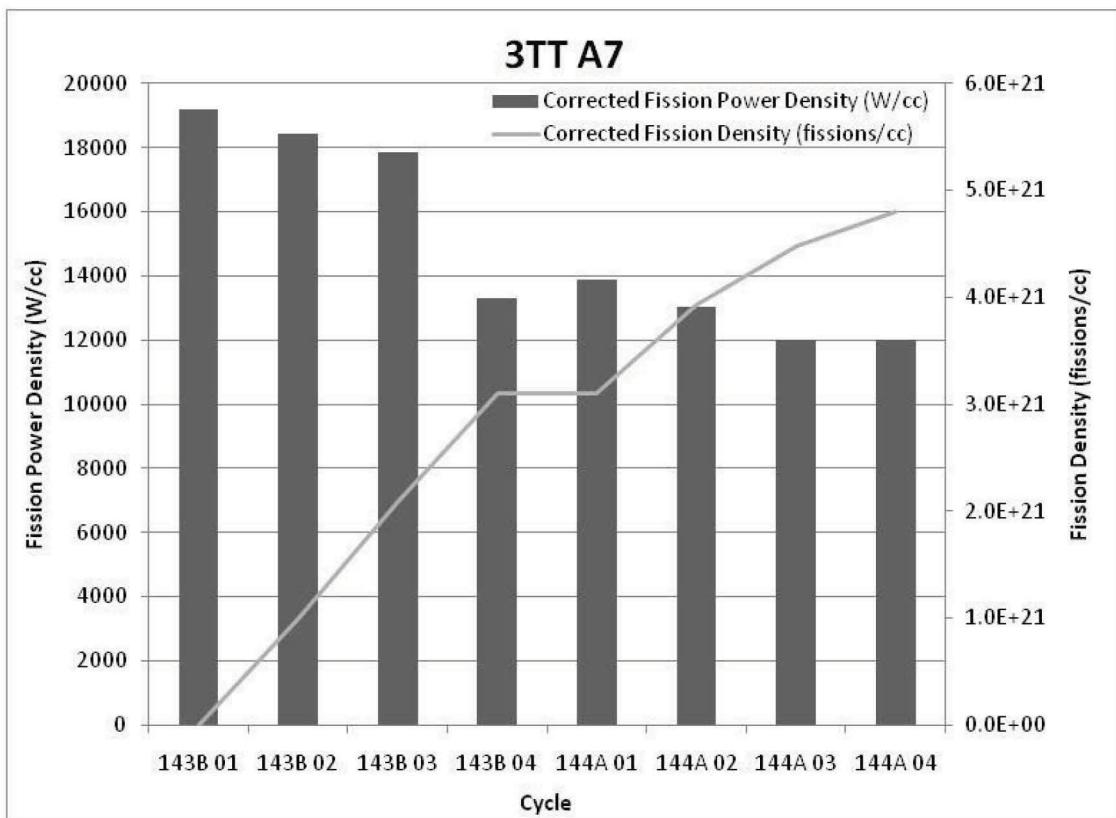
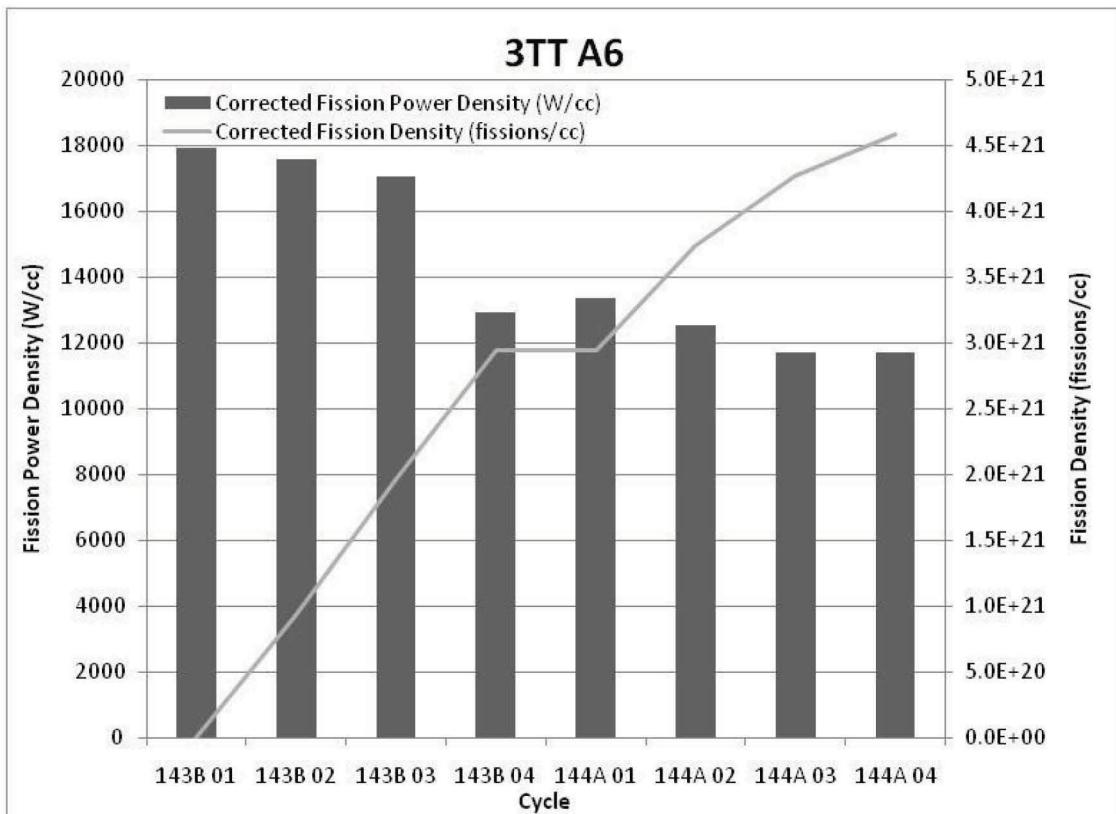
Power and Fission Density Plots

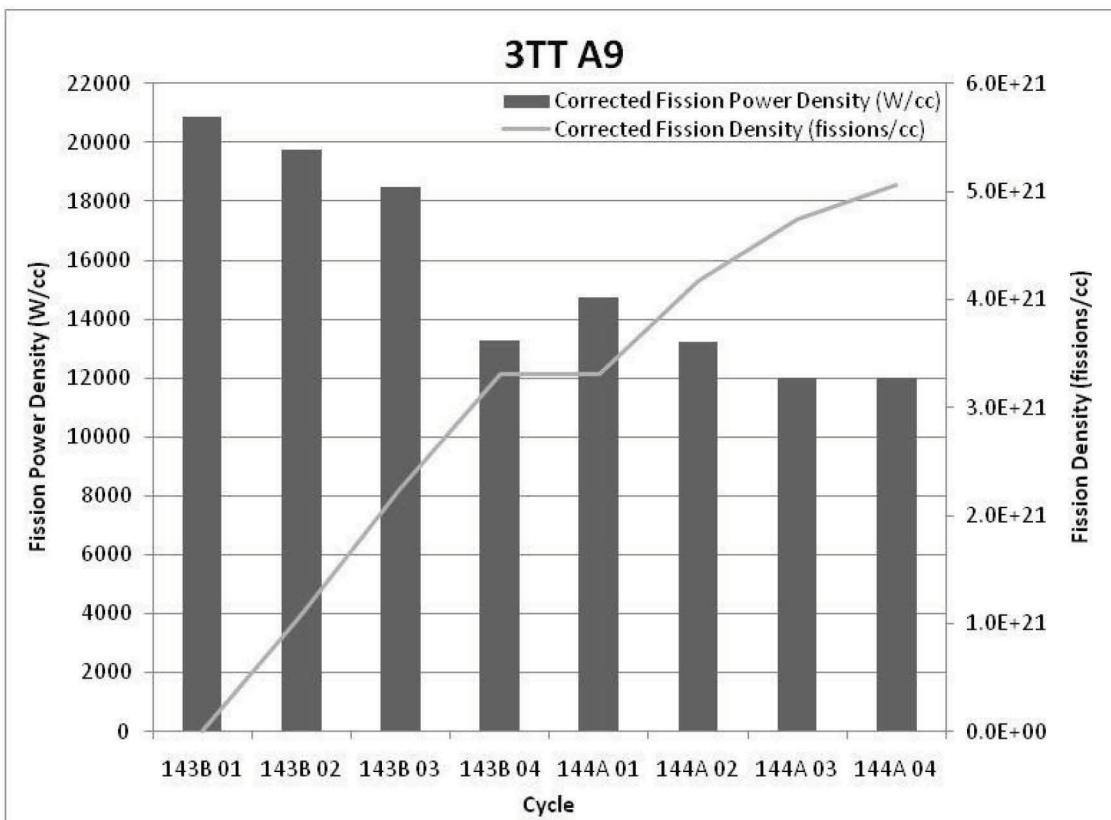
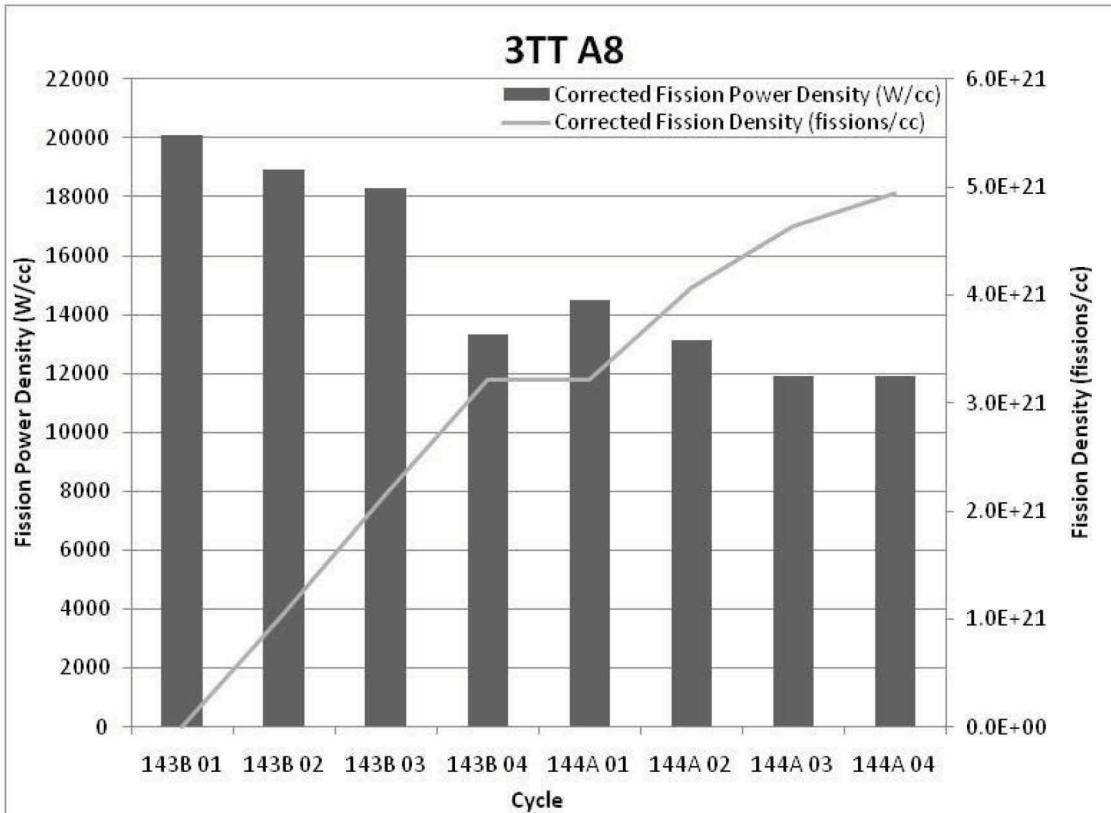
A-1. Plate 3TT

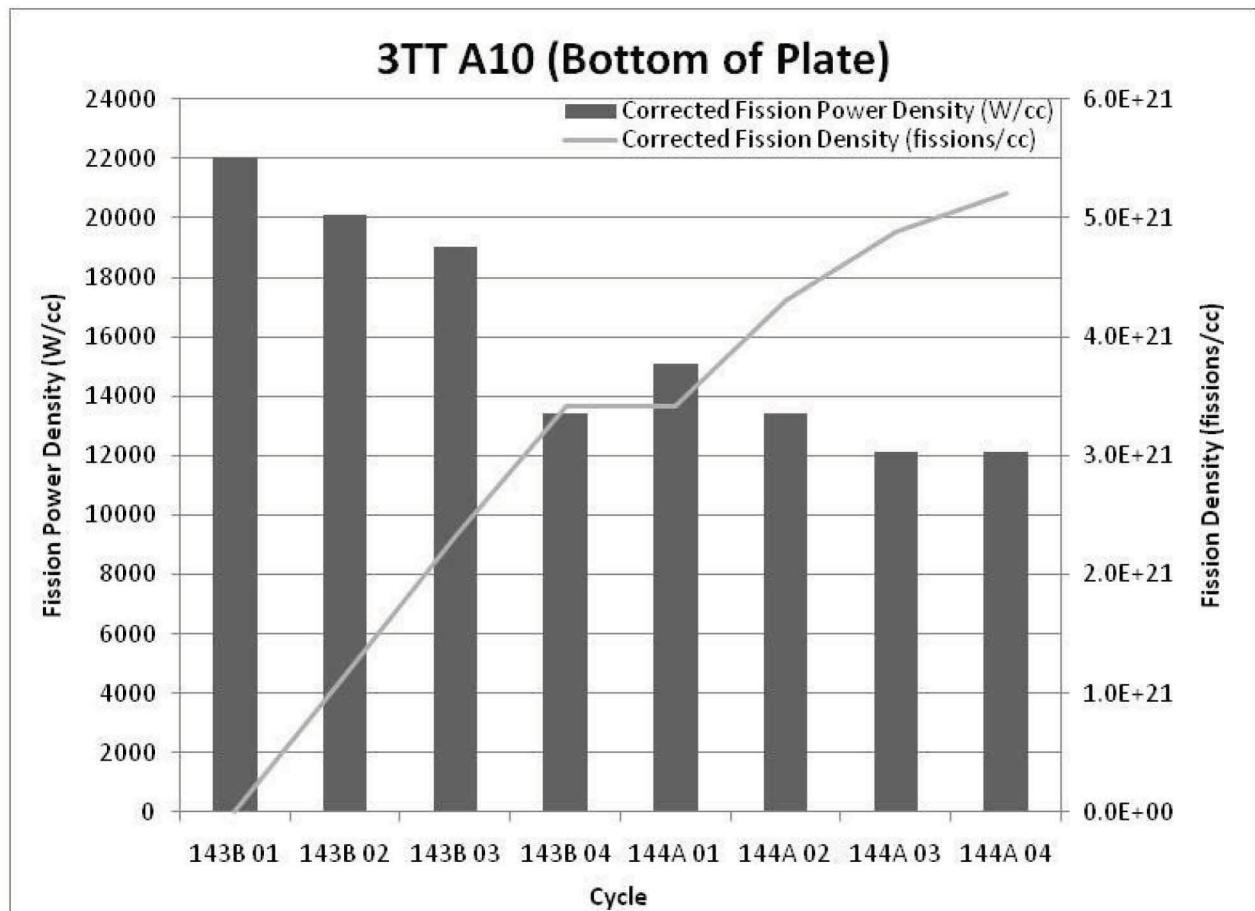




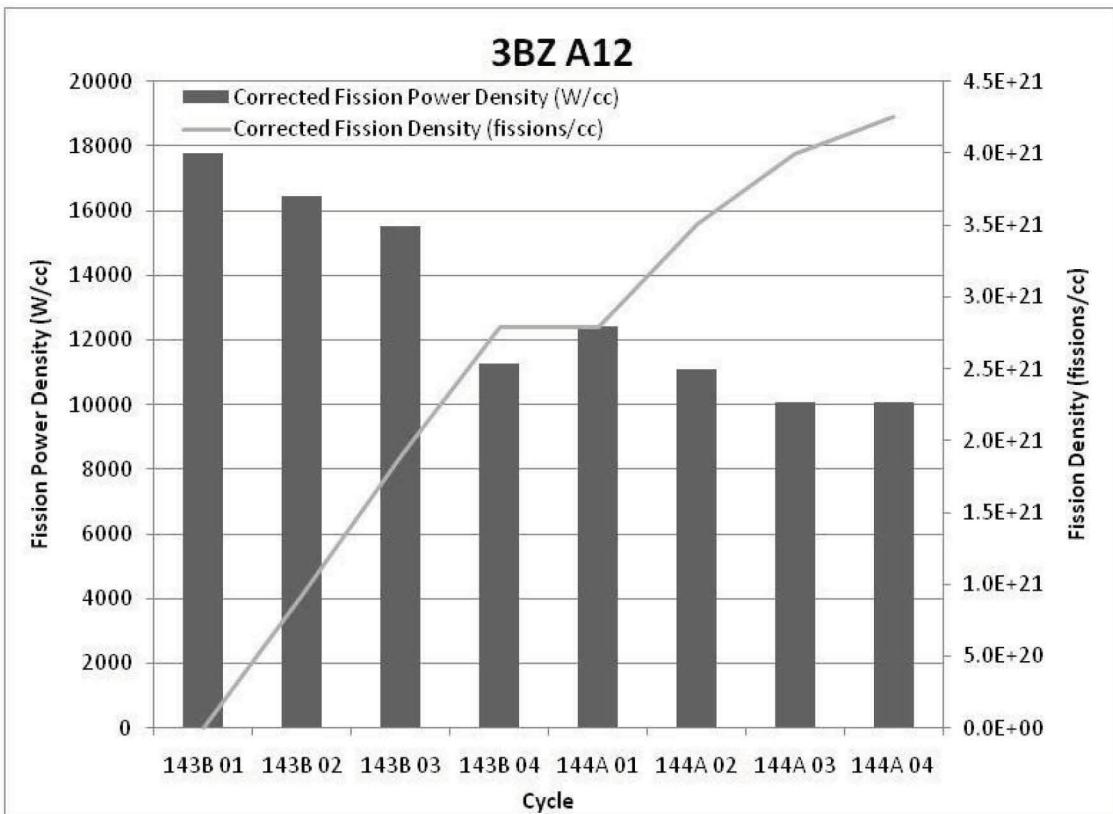


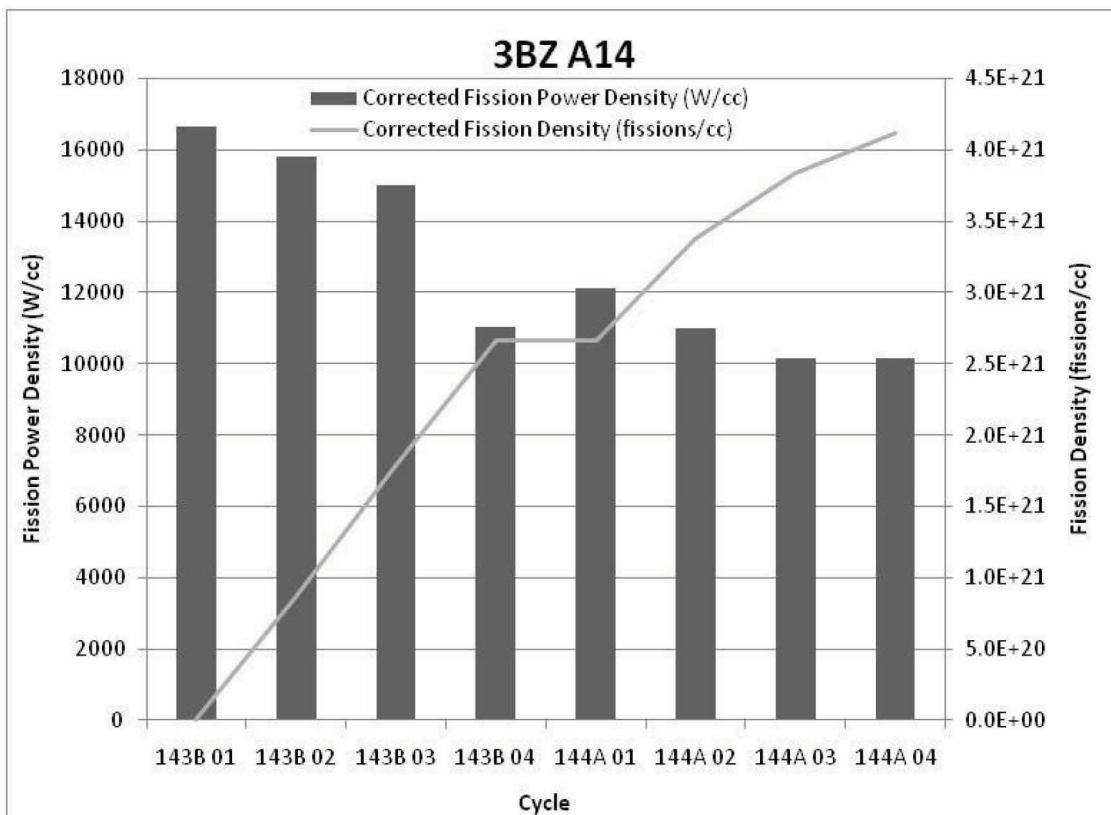
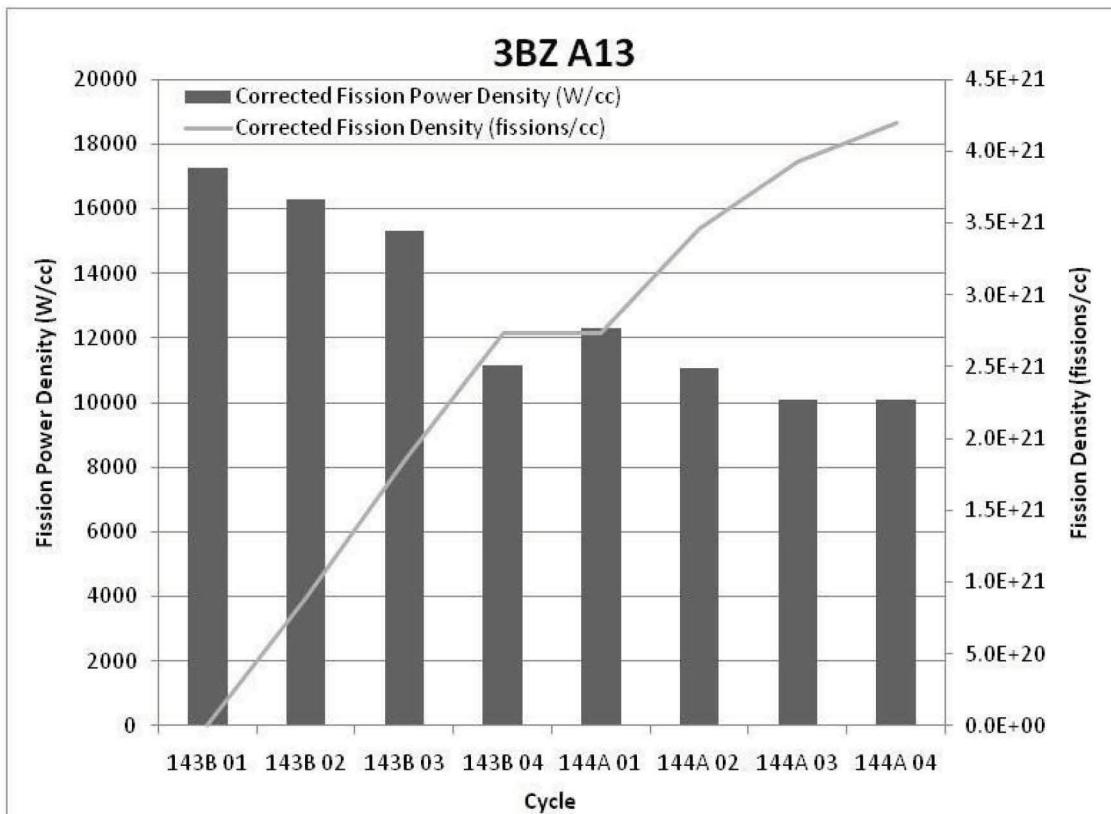


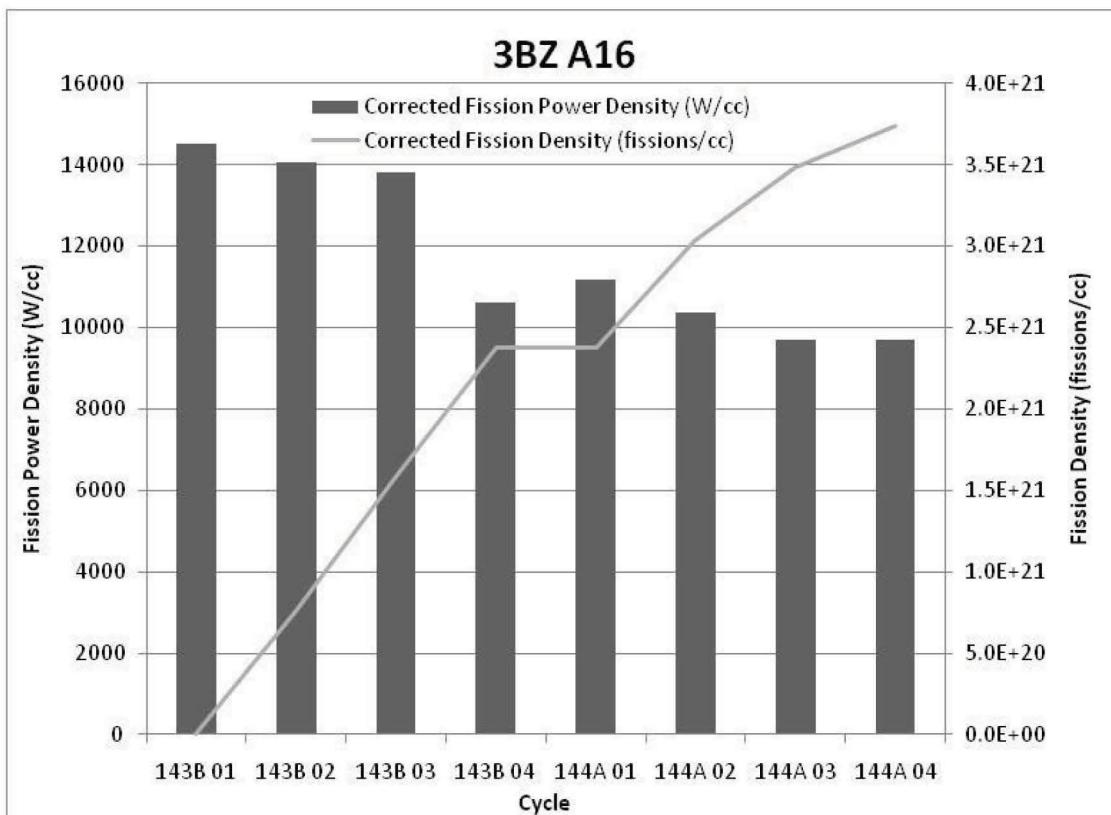
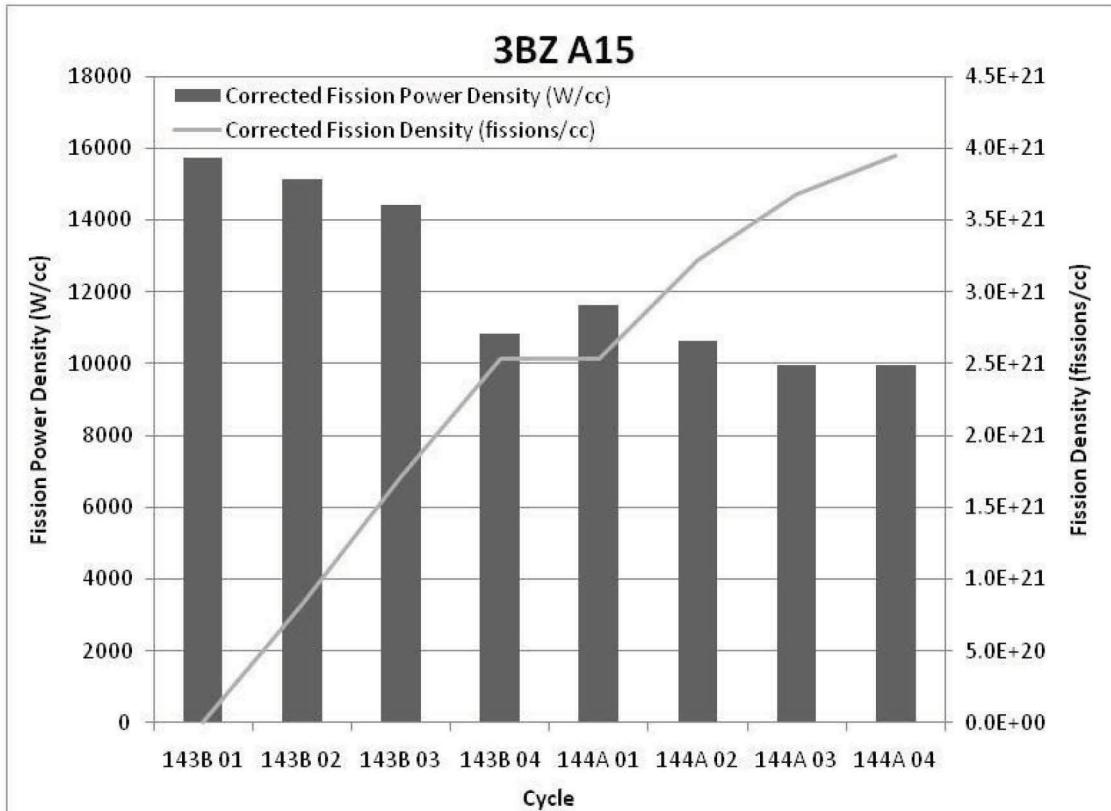


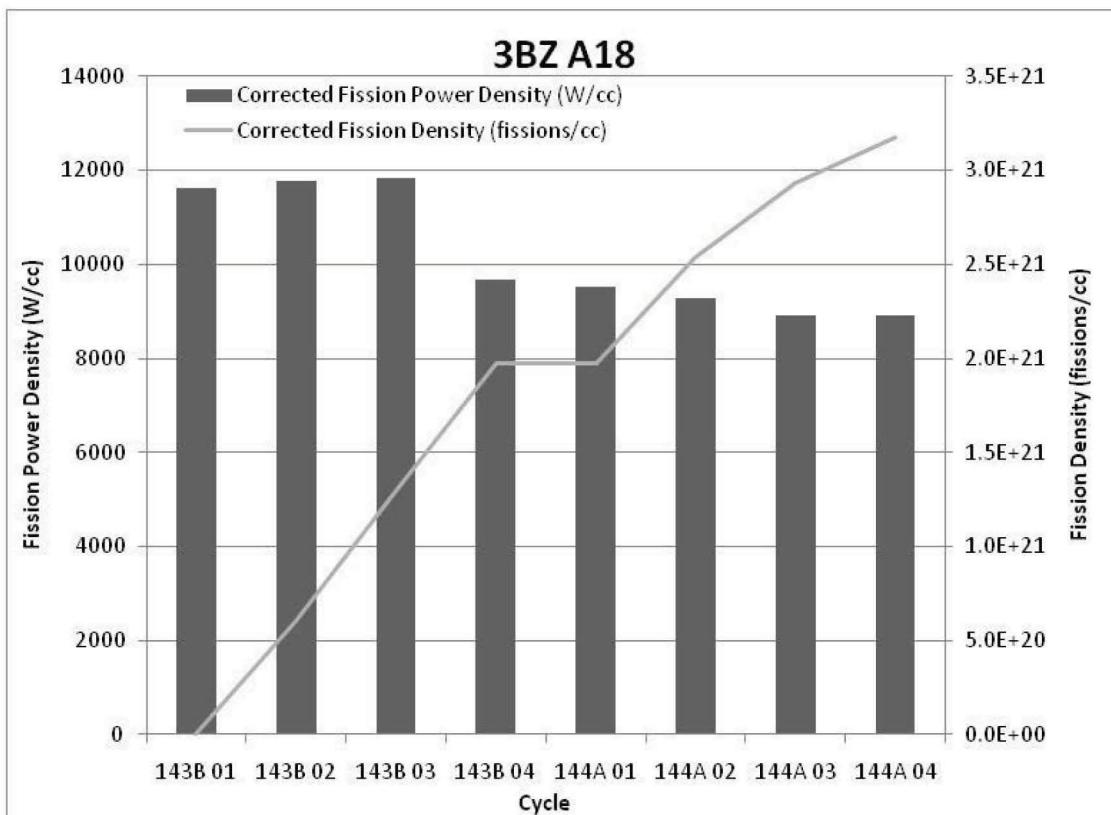
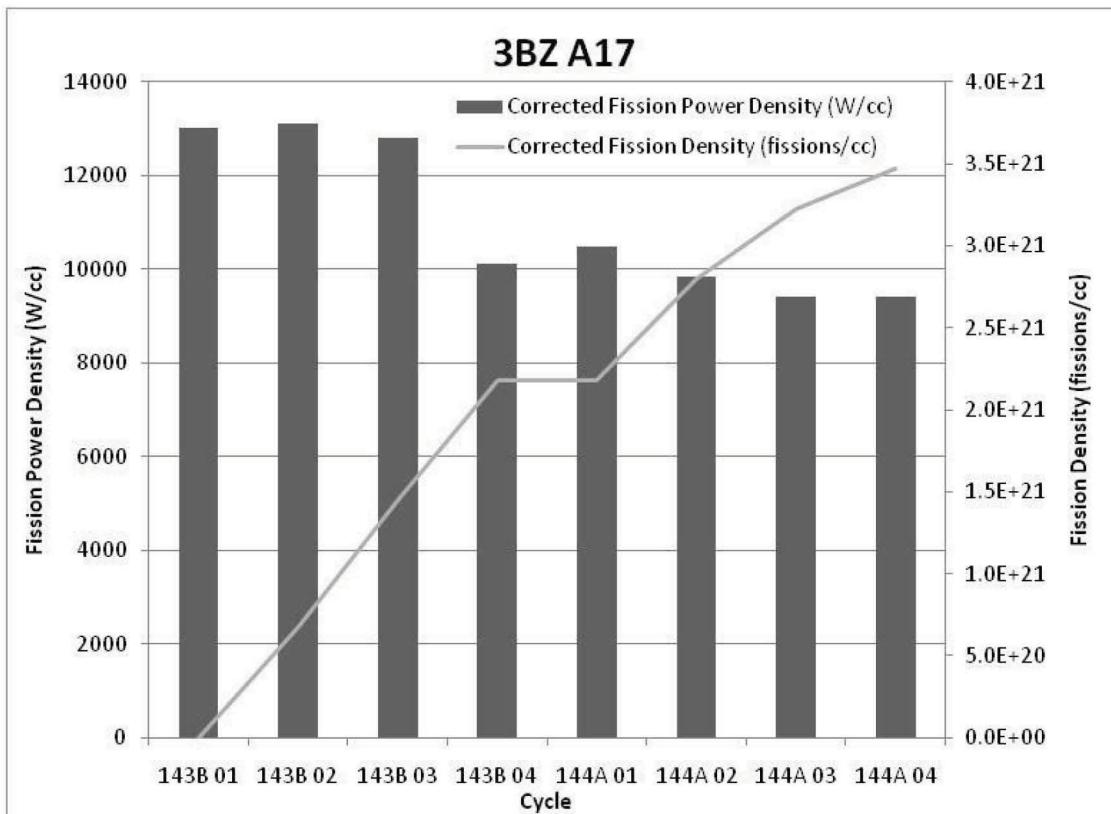


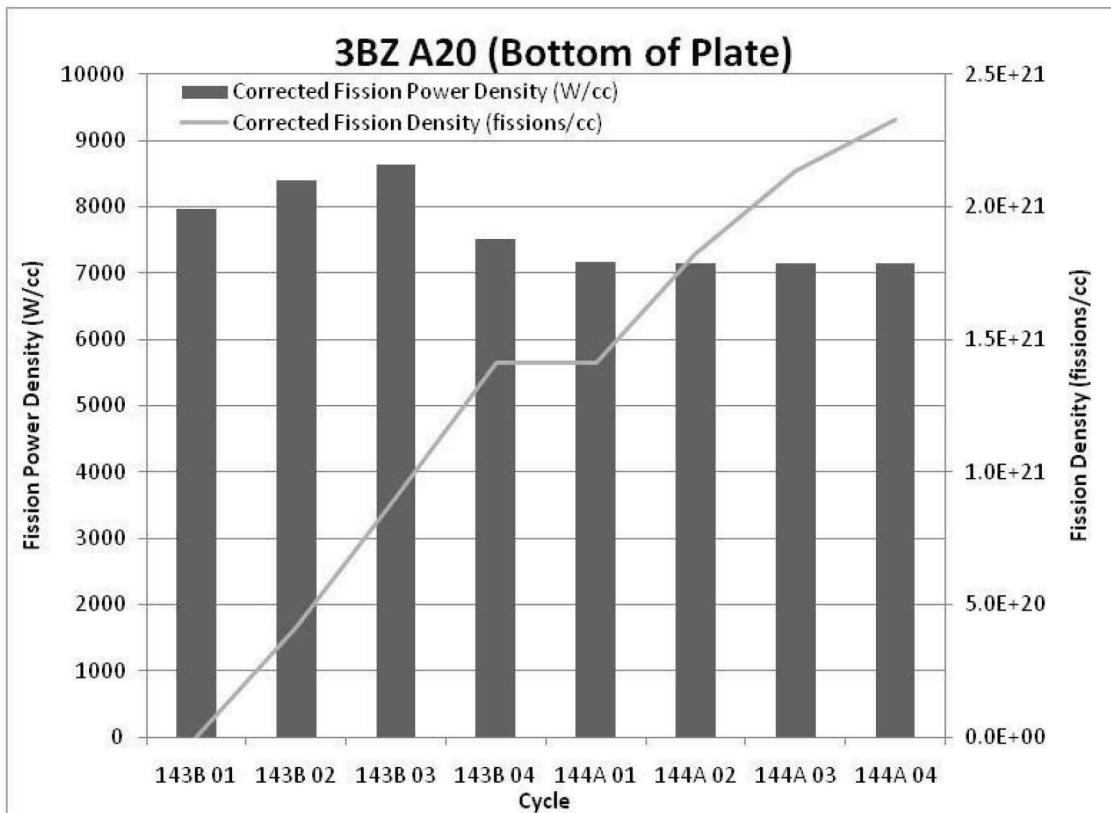
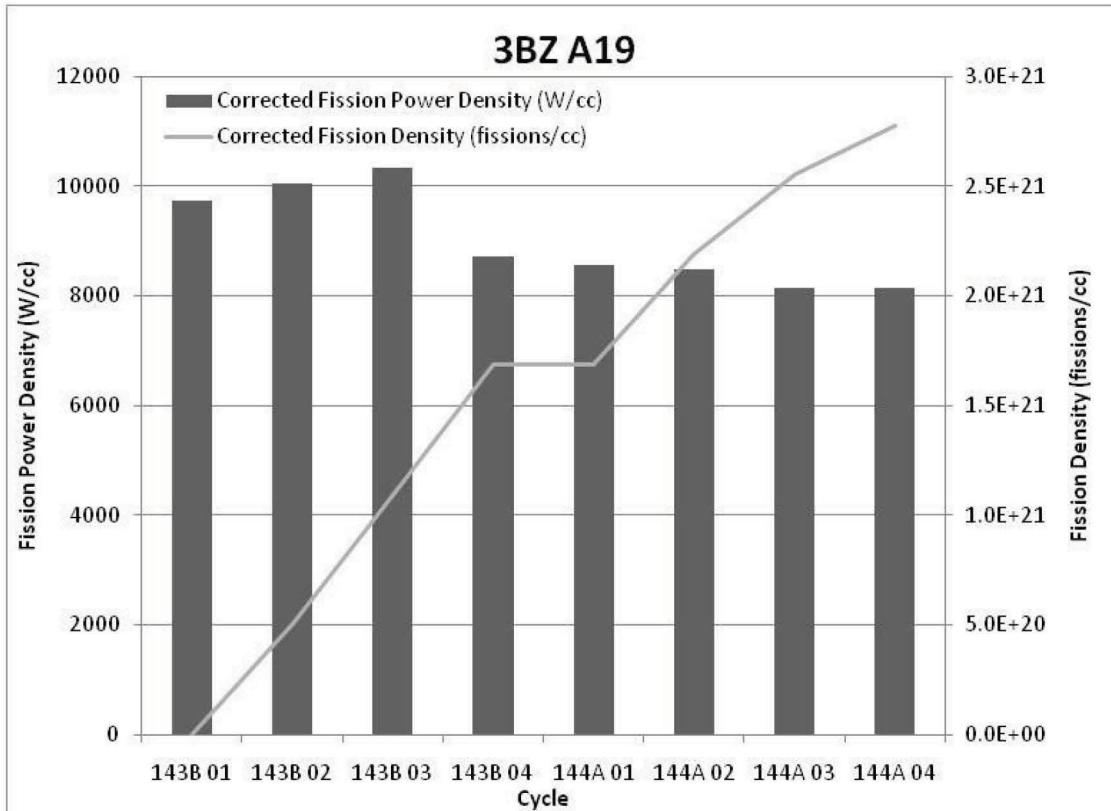
A-2. Plate 3BZ











Appendix B

Plate Surface Temperatures

Appendix B

Table B - 1. Temperature (°C) map of the east side of plate 3TT at BOC 143B (0 EFPD).

Length of Plate (in)	Width of Plate (inches)									
	0.05	0.25	0.50	0.75	1.00	1.25	1.50	1.75	2.00	2.24
0.125	51.94	51.78	51.77	51.77	51.77	51.77	51.77	51.77	51.80	51.94
1.00	52.99	52.48	52.65	52.67	52.67	52.67	52.67	52.59	52.43	52.89
2.00	56.88	81.02	83.97	84.04	84.05	84.05	84.04	83.78	70.81	55.50
3.00	57.27	81.30	84.28	84.35	84.36	84.36	84.34	84.07	71.11	55.86
4.00	58.37	87.56	91.04	91.12	91.13	91.13	91.11	90.81	75.41	56.66
5.00	58.67	87.76	91.25	91.33	91.34	91.34	91.32	91.01	75.63	56.95
6.00	59.89	94.26	98.24	98.34	98.35	98.35	98.32	97.99	80.17	57.81
7.00	60.23	94.49	98.48	98.58	98.60	98.60	98.57	98.22	80.43	58.13
8.00	61.48	100.92	105.72	105.85	105.87	105.87	105.83	105.40	84.93	59.01
9.00	61.77	101.16	105.98	106.11	106.13	106.13	106.09	105.65	85.18	59.36
10.00	62.92	107.07	112.37	112.52	112.54	112.54	112.49	112.02	89.13	60.17
11.00	63.22	107.33	112.64	112.80	112.82	112.82	112.77	112.28	89.38	60.43
12.00	64.44	113.15	118.93	119.09	119.12	119.12	119.06	118.54	93.28	61.33
13.00	64.74	113.44	119.22	119.40	119.43	119.43	119.36	118.83	93.56	61.64
14.00	65.56	117.24	123.32	123.50	123.54	123.53	123.46	122.91	96.12	62.26
15.00	65.89	117.53	123.62	123.81	123.85	123.85	123.77	123.20	96.40	62.54
16.00	66.62	120.40	126.69	126.89	126.93	126.93	126.85	126.26	98.43	63.09
17.00	66.94	120.69	126.99	127.20	127.25	127.24	127.15	126.56	98.77	63.46
18.00	67.55	123.09	129.56	129.78	129.82	129.82	129.72	129.12	100.53	63.96
19.00	67.89	123.40	129.88	130.10	130.15	130.15	130.05	129.43	100.86	64.26
20.00	68.67	126.87	133.60	133.83	133.89	133.89	133.77	133.14	103.37	64.81
21.00	69.00	127.16	133.90	134.14	134.20	134.20	134.08	133.43	103.68	65.10
22.00	61.27	67.52	69.59	69.81	69.89	69.88	69.73	69.13	64.43	60.25
22.50	58.75	59.06	59.44	59.62	59.70	59.69	59.53	59.25	58.86	58.41

Table B - 2.Temperature (°C) map of the west side of plate 3TT at BOC 143B (0 EFPD).

Length of Plate (in)	Width of Plate (inches)									
	0.05	0.25	0.50	0.75	1.00	1.25	1.50	1.75	2.00	2.24
0.125	51.98	51.78	51.77	51.77	51.77	51.77	51.77	51.77	51.80	51.97
1.00	53.19	52.48	52.65	52.67	52.68	52.67	52.67	52.60	52.43	53.00
2.00	57.56	81.03	83.98	84.05	84.06	84.06	84.05	83.79	70.81	55.81
3.00	57.99	81.33	84.30	84.38	84.38	84.38	84.37	84.09	71.12	56.18
4.00	59.20	87.61	91.08	91.17	91.18	91.17	91.16	90.86	75.44	57.04
5.00	59.53	87.84	91.31	91.40	91.41	91.41	91.39	91.08	75.68	57.33
6.00	60.87	94.36	98.33	98.43	98.44	98.44	98.42	98.08	80.24	58.23
7.00	61.24	94.63	98.60	98.71	98.72	98.72	98.69	98.35	80.53	58.55
8.00	62.59	101.10	105.89	106.02	106.04	106.04	106.00	105.57	85.05	59.47
9.00	62.91	101.38	106.18	106.32	106.34	106.34	106.30	105.86	85.33	59.91
10.00	64.14	107.32	112.61	112.76	112.78	112.78	112.73	112.26	89.30	60.73
11.00	64.53	107.66	112.96	113.12	113.14	113.14	113.09	112.60	89.62	61.02
12.00	65.78	113.48	119.24	119.41	119.43	119.43	119.37	118.86	93.51	61.89
13.00	66.11	113.80	119.57	119.74	119.78	119.77	119.71	119.18	93.83	62.22
14.00	66.98	117.64	123.70	123.88	123.92	123.92	123.85	123.30	96.42	62.86
15.00	67.33	117.98	124.04	124.23	124.27	124.27	124.19	123.63	96.74	63.13
16.00	68.11	120.88	127.16	127.36	127.40	127.39	127.31	126.73	98.85	63.68
17.00	68.45	121.22	127.50	127.70	127.75	127.74	127.65	127.07	99.22	64.13
18.00	69.10	123.65	130.10	130.31	130.36	130.36	130.26	129.66	101.02	64.67
19.00	69.46	124.01	130.46	130.68	130.73	130.72	130.62	130.02	101.39	64.95
20.00	70.29	127.52	134.22	134.45	134.50	134.50	134.39	133.77	103.94	65.48
21.00	70.64	127.85	134.56	134.79	134.85	134.84	134.73	134.10	104.29	65.76
22.00	62.17	68.13	70.16	70.38	70.46	70.45	70.30	69.71	65.04	60.64
22.50	59.47	59.70	60.06	60.23	60.31	60.30	60.15	59.88	59.49	58.79

Table B - 3. Temperature (°C) map of the east side of plate 3BZ at BOC 143B (0 EFPD).

Length of Plate (in)	Width of Plate (inches)									
	0.05	0.25	0.50	0.75	1.00	1.25	1.50	1.75	2.00	2.24
22.625	58.92	59.11	59.50	59.68	59.76	59.75	59.59	59.31	58.90	58.56
23.00	60.68	65.17	66.76	66.97	67.05	67.04	66.89	66.38	62.90	59.85
24.00	66.63	109.47	114.71	114.95	115.02	115.01	114.88	114.30	91.86	63.71
25.00	66.83	109.63	114.86	115.10	115.18	115.17	115.03	114.45	92.06	63.91
26.00	66.83	108.35	113.45	113.71	113.78	113.78	113.63	113.04	91.31	64.02
27.00	67.00	108.57	113.67	113.93	114.00	114.00	113.85	113.26	91.53	64.21
28.00	67.00	107.49	112.49	112.75	112.83	112.82	112.66	112.07	90.89	64.24
29.00	67.18	107.72	112.71	112.98	113.06	113.05	112.89	112.30	91.10	64.36
30.00	67.15	106.50	111.38	111.64	111.73	111.72	111.55	110.97	90.38	64.40
31.00	67.29	106.70	111.57	111.84	111.93	111.93	111.75	111.16	90.58	64.55
32.00	67.11	104.63	109.31	109.59	109.67	109.67	109.49	108.91	89.30	64.47
33.00	67.23	104.84	109.51	109.79	109.88	109.88	109.70	109.11	89.49	64.56
34.00	66.93	102.03	106.44	106.72	106.82	106.81	106.62	106.05	87.73	64.41
35.00	67.03	102.20	106.61	106.89	106.99	106.98	106.80	106.22	87.90	64.54
36.00	66.55	98.50	102.57	102.85	102.95	102.94	102.75	102.19	85.56	64.27
37.00	66.63	98.67	102.74	103.02	103.12	103.11	102.92	102.36	85.71	64.32
38.00	66.19	95.27	99.01	99.29	99.40	99.39	99.19	98.65	83.55	64.02
39.00	66.24	95.40	99.14	99.42	99.52	99.52	99.32	98.78	83.67	64.05
40.00	65.59	90.60	93.87	94.15	94.25	94.24	94.04	93.52	80.60	63.66
41.00	65.58	90.69	93.95	94.23	94.34	94.33	94.13	93.62	80.69	63.66
42.00	64.93	86.28	89.01	89.27	89.37	89.36	89.17	88.71	77.78	63.21
43.00	64.89	86.35	89.07	89.33	89.42	89.42	89.22	88.77	77.84	63.17
44.00	61.91	64.09	64.68	64.94	65.06	65.05	64.82	64.46	63.56	61.22
45.00	61.36	63.62	64.06	64.30	64.42	64.41	64.19	63.88	63.17	60.77

Table B - 4. Temperature (°C) map of the west side of plate 3BZ at BOC 143B (0 EFPD).

Length of Plate (in)	Width of Plate (inches)									
	0.05	0.25	0.50	0.75	1.00	1.25	1.50	1.75	2.00	2.24
22.625	59.59	59.75	60.12	60.29	60.37	60.36	60.21	59.93	59.54	58.90
23.00	61.57	65.81	67.37	67.58	67.65	67.64	67.49	67.00	63.53	60.24
24.00	68.16	110.29	115.49	115.72	115.79	115.78	115.65	115.09	92.50	64.36
25.00	68.37	110.50	115.68	115.92	115.98	115.98	115.84	115.28	92.73	64.57
26.00	68.37	109.25	114.32	114.56	114.63	114.62	114.48	113.91	92.02	64.74
27.00	68.55	109.51	114.58	114.82	114.89	114.89	114.74	114.17	92.28	64.95
28.00	68.55	108.47	113.44	113.68	113.76	113.75	113.60	113.03	91.67	64.95
29.00	68.73	108.75	113.71	113.96	114.04	114.03	113.88	113.30	91.94	65.04
30.00	68.70	107.58	112.42	112.67	112.75	112.75	112.59	112.01	91.25	65.06
31.00	68.84	107.82	112.66	112.92	112.99	112.99	112.83	112.25	91.49	65.23
32.00	68.64	105.80	110.45	110.71	110.79	110.78	110.61	110.04	90.23	65.14
33.00	68.77	106.05	110.70	110.96	111.04	111.03	110.87	110.29	90.47	65.22
34.00	68.45	103.30	107.68	107.94	108.03	108.02	107.84	107.28	88.74	65.07
35.00	68.55	103.51	107.89	108.15	108.24	108.23	108.06	107.49	88.94	65.24
36.00	68.02	99.86	103.90	104.16	104.25	104.25	104.06	103.52	86.65	64.98
37.00	68.10	100.08	104.11	104.38	104.47	104.46	104.28	103.73	86.84	65.00
38.00	67.62	96.73	100.44	100.71	100.80	100.79	100.60	100.08	84.72	64.64
39.00	67.66	96.90	100.61	100.87	100.97	100.96	100.77	100.24	84.87	64.67
40.00	66.95	92.14	95.39	95.66	95.75	95.75	95.55	95.05	81.86	64.26
41.00	66.94	92.27	95.52	95.78	95.88	95.87	95.67	95.18	81.97	64.26
42.00	66.20	87.81	90.61	90.86	90.96	90.95	90.75	90.29	79.12	63.76
43.00	66.16	87.91	90.70	90.95	91.05	91.04	90.85	90.39	79.21	63.72
44.00	62.73	65.41	65.99	66.23	66.34	66.33	66.11	65.75	64.84	61.59
45.00	62.10	64.94	65.37	65.61	65.72	65.70	65.49	65.19	64.47	61.12

Table B - 5. Temperature (°C) map of the east side of plate 3TT at MOC1 143B (18.0 EFPD).

Length of Plate (in)	Width of Plate (inches)									
	0.05	0.25	0.50	0.75	1.00	1.25	1.50	1.75	2.00	2.24
0.125	51.94	51.78	51.77	51.77	51.77	51.77	51.77	51.77	51.80	51.94
1.00	53.04	52.52	52.71	52.73	52.73	52.73	52.72	52.64	52.46	52.93
2.00	57.18	82.74	85.83	85.91	85.91	85.91	85.90	85.63	71.98	55.71
3.00	57.58	83.03	86.16	86.24	86.24	86.24	86.23	85.94	72.30	56.08
4.00	58.80	89.98	93.65	93.73	93.74	93.74	93.72	93.41	77.08	56.96
5.00	59.10	90.19	93.86	93.95	93.96	93.96	93.94	93.62	77.31	57.25
6.00	60.24	96.07	100.19	100.30	100.32	100.32	100.29	99.93	81.45	58.05
7.00	60.58	96.31	100.48	100.60	100.62	100.62	100.58	100.19	81.71	58.37
8.00	61.77	102.45	107.39	107.52	107.54	107.54	107.50	107.06	85.96	59.22
9.00	62.07	102.70	107.65	107.79	107.81	107.80	107.76	107.31	86.22	59.58
10.00	62.95	106.89	112.17	112.32	112.35	112.34	112.30	111.82	89.03	60.21
11.00	63.29	107.18	112.48	112.63	112.66	112.66	112.60	112.11	89.31	60.51
12.00	64.31	112.14	117.83	118.00	118.03	118.03	117.97	117.45	92.64	61.26
13.00	64.61	112.42	118.12	118.29	118.32	118.32	118.26	117.73	92.91	61.56
14.00	65.27	115.13	121.04	121.22	121.25	121.25	121.18	120.63	94.76	62.08
15.00	65.58	115.41	121.32	121.51	121.55	121.55	121.47	120.91	95.02	62.34
16.00	66.11	117.08	123.11	123.31	123.35	123.35	123.26	122.69	96.21	62.76
17.00	66.41	117.36	123.39	123.60	123.64	123.64	123.55	122.96	96.49	63.11
18.00	67.03	120.02	126.24	126.46	126.51	126.50	126.41	125.81	98.41	63.62
19.00	67.37	120.32	126.56	126.78	126.83	126.83	126.72	126.12	98.73	63.91
20.00	67.82	121.59	127.90	128.13	128.18	128.18	128.07	127.45	99.71	64.24
21.00	68.08	121.84	128.15	128.39	128.45	128.44	128.32	127.70	99.98	64.48
22.00	60.99	66.69	68.61	68.83	68.91	68.90	68.75	68.18	63.85	60.03
22.50	58.68	58.92	59.28	59.46	59.54	59.53	59.37	59.10	58.73	58.34

Table B - 6. Temperature (°C) map of the west side of plate 3TT at MOC1 143B (18.0 EFPD).

Length of Plate (in)	Width of Plate (inches)									
	0.05	0.25	0.50	0.75	1.00	1.25	1.50	1.75	2.00	2.24
0.125	51.98	51.78	51.77	51.77	51.77	51.77	51.77	51.77	51.80	51.97
1.00	53.24	52.53	52.71	52.73	52.73	52.73	52.72	52.65	52.46	53.04
2.00	57.91	82.75	85.85	85.92	85.92	85.92	85.91	85.64	71.97	56.04
3.00	58.35	83.07	86.19	86.27	86.27	86.27	86.26	85.97	72.31	56.43
4.00	59.68	90.03	93.70	93.79	93.79	93.79	93.78	93.46	77.11	57.36
5.00	60.02	90.27	93.94	94.03	94.04	94.04	94.02	93.70	77.37	57.66
6.00	61.26	96.18	100.31	100.42	100.44	100.43	100.41	100.03	81.53	58.50
7.00	61.63	96.45	100.64	100.76	100.77	100.77	100.74	100.35	81.82	58.82
8.00	62.92	102.65	107.57	107.71	107.73	107.73	107.69	107.25	86.09	59.70
9.00	63.24	102.94	107.87	108.01	108.03	108.03	107.99	107.54	86.38	60.14
10.00	64.18	107.16	112.43	112.58	112.60	112.60	112.55	112.08	89.22	60.77
11.00	64.55	107.50	112.77	112.93	112.96	112.96	112.90	112.41	89.53	61.05
12.00	65.65	112.49	118.16	118.33	118.36	118.36	118.30	117.78	92.89	61.81
13.00	65.97	112.81	118.49	118.66	118.70	118.69	118.63	118.10	93.19	62.14
14.00	66.67	115.56	121.44	121.63	121.66	121.66	121.59	121.04	95.07	62.67
15.00	67.00	115.88	121.77	121.96	122.00	121.99	121.91	121.36	95.37	62.93
16.00	67.57	117.59	123.60	123.79	123.84	123.83	123.75	123.18	96.61	63.34
17.00	67.89	117.91	123.92	124.12	124.16	124.16	124.07	123.50	96.96	63.77
18.00	68.55	120.61	126.81	127.02	127.07	127.06	126.97	126.38	98.92	64.32
19.00	68.90	120.95	127.16	127.38	127.43	127.42	127.32	126.72	99.28	64.59
20.00	69.37	122.26	128.54	128.77	128.82	128.82	128.71	128.10	100.30	64.88
21.00	69.65	122.55	128.83	129.06	129.12	129.11	129.00	128.39	100.60	65.12
22.00	61.88	67.31	69.20	69.41	69.48	69.47	69.33	68.77	64.46	60.42
22.50	59.40	59.57	59.91	60.08	60.15	60.14	60.00	59.73	59.37	58.72

Table B - 7. Temperature (°C) map of the east side of plate 3BZ at MOC1 143B (18.0 EFPD).

Length of Plate (in)	Width of Plate (inches)									
	0.05	0.25	0.50	0.75	1.00	1.25	1.50	1.75	2.00	2.24
22.625	58.83	58.97	59.34	59.51	59.59	59.58	59.43	59.15	58.78	58.49
23.00	60.46	64.56	66.05	66.25	66.33	66.32	66.17	65.69	62.46	59.67
24.00	65.95	105.58	110.49	110.73	110.79	110.79	110.65	110.10	89.30	63.24
25.00	66.15	105.77	110.66	110.91	110.98	110.97	110.83	110.27	89.51	63.44
26.00	66.20	104.87	109.68	109.92	110.00	109.99	109.84	109.28	89.01	63.58
27.00	66.37	105.08	109.89	110.14	110.22	110.21	110.06	109.50	89.22	63.77
28.00	66.51	104.98	109.76	110.01	110.09	110.09	109.93	109.36	89.21	63.88
29.00	66.68	105.20	109.98	110.24	110.32	110.32	110.16	109.59	89.42	64.00
30.00	66.68	104.22	108.90	109.16	109.25	109.24	109.08	108.51	88.85	64.06
31.00	66.82	104.41	109.10	109.36	109.44	109.44	109.27	108.70	89.03	64.21
32.00	66.72	102.91	107.45	107.72	107.80	107.80	107.62	107.06	88.12	64.18
33.00	66.84	103.12	107.65	107.92	108.01	108.00	107.83	107.26	88.31	64.27
34.00	66.57	100.62	104.91	105.18	105.28	105.27	105.09	104.53	86.74	64.13
35.00	66.67	100.79	105.08	105.36	105.45	105.44	105.26	104.70	86.91	64.27
36.00	66.42	98.49	102.57	102.84	102.94	102.93	102.74	102.19	85.48	64.15
37.00	66.50	98.67	102.74	103.02	103.11	103.11	102.92	102.37	85.64	64.21
38.00	66.09	95.45	99.22	99.50	99.60	99.59	99.40	98.86	83.60	63.92
39.00	66.14	95.59	99.36	99.63	99.73	99.72	99.53	99.00	83.73	63.96
40.00	65.56	91.22	94.57	94.85	94.95	94.94	94.74	94.23	80.95	63.61
41.00	65.56	91.33	94.67	94.94	95.04	95.04	94.84	94.33	81.04	63.62
42.00	64.95	87.20	90.02	90.27	90.38	90.37	90.17	89.72	78.32	63.20
43.00	64.92	87.26	90.08	90.34	90.45	90.44	90.24	89.79	78.38	63.17
44.00	61.77	63.87	64.45	64.71	64.82	64.81	64.59	64.23	63.34	61.11
45.00	61.20	63.37	63.80	64.04	64.15	64.14	63.92	63.63	62.94	60.64

Table B - 8. Temperature (°C) map of the west side of plate 3BZ at MOC1 143B (18.0 EFPD).

Length of Plate (in)	Width of Plate (inches)									
	0.05	0.25	0.50	0.75	1.00	1.25	1.50	1.75	2.00	2.24
22.625	59.50	59.62	59.96	60.13	60.21	60.20	60.05	59.79	59.42	58.82
23.00	61.33	65.20	66.66	66.87	66.94	66.93	66.78	66.31	63.10	60.06
24.00	67.41	106.42	111.29	111.52	111.58	111.57	111.44	110.90	89.95	63.86
25.00	67.63	106.64	111.50	111.73	111.80	111.79	111.66	111.11	90.19	64.07
26.00	67.69	105.77	110.55	110.78	110.85	110.85	110.71	110.16	89.72	64.27
27.00	67.87	106.03	110.80	111.04	111.11	111.11	110.96	110.41	89.96	64.49
28.00	68.01	105.96	110.71	110.95	111.03	111.02	110.87	110.32	89.99	64.58
29.00	68.19	106.23	110.98	111.22	111.30	111.29	111.14	110.58	90.23	64.66
30.00	68.19	105.29	109.94	110.19	110.27	110.26	110.10	109.55	89.69	64.71
31.00	68.34	105.53	110.17	110.43	110.50	110.50	110.34	109.78	89.91	64.87
32.00	68.23	104.07	108.57	108.83	108.91	108.90	108.74	108.18	89.04	64.84
33.00	68.36	104.30	108.80	109.05	109.13	109.13	108.96	108.41	89.24	64.93
34.00	68.06	101.87	106.13	106.39	106.47	106.47	106.30	105.75	87.74	64.78
35.00	68.17	102.08	106.34	106.60	106.69	106.68	106.51	105.96	87.94	64.95
36.00	67.89	99.83	103.88	104.13	104.22	104.21	104.04	103.50	86.55	64.86
37.00	67.98	100.03	104.07	104.33	104.42	104.41	104.24	103.70	86.73	64.89
38.00	67.54	96.89	100.63	100.89	100.98	100.97	100.79	100.27	84.75	64.56
39.00	67.58	97.06	100.80	101.06	101.15	101.14	100.96	100.44	84.91	64.59
40.00	66.94	92.75	96.08	96.34	96.43	96.42	96.23	95.73	82.18	64.23
41.00	66.94	92.89	96.21	96.47	96.56	96.56	96.37	95.87	82.30	64.24
42.00	66.26	88.72	91.61	91.86	91.96	91.95	91.76	91.30	79.64	63.77
43.00	66.22	88.82	91.71	91.97	92.06	92.05	91.86	91.40	79.73	63.74
44.00	62.60	65.18	65.75	65.99	66.10	66.09	65.87	65.52	64.62	61.48
45.00	61.94	64.68	65.11	65.33	65.44	65.43	65.22	64.92	64.22	60.99

Table B - 9. Temperature (°C) map of the east side of plate 3TT at MOC2 143B (38.0 EFPD).

Length of Plate (in)	Width of Plate (inches)									
	0.05	0.25	0.50	0.75	1.00	1.25	1.50	1.75	2.00	2.24
0.125	51.94	51.78	51.77	51.77	51.77	51.77	51.77	51.77	51.80	51.94
1.00	53.08	52.58	52.77	52.80	52.80	52.80	52.79	52.71	52.50	52.97
2.00	57.52	84.86	88.13	88.20	88.21	88.21	88.20	87.92	73.42	55.94
3.00	57.92	85.15	88.45	88.53	88.54	88.54	88.52	88.23	73.74	56.31
4.00	59.06	91.45	95.24	95.33	95.33	95.33	95.32	95.00	78.11	57.14
5.00	59.36	91.66	95.45	95.55	95.56	95.56	95.54	95.21	78.34	57.43
6.00	60.46	97.27	101.58	101.70	101.71	101.71	101.68	101.29	82.29	58.20
7.00	60.79	97.51	101.87	101.99	102.01	102.01	101.97	101.57	82.56	58.52
8.00	61.80	102.44	107.37	107.51	107.53	107.53	107.49	107.04	85.96	59.24
9.00	62.09	102.69	107.63	107.77	107.79	107.79	107.75	107.29	86.22	59.59
10.00	62.96	106.84	112.12	112.27	112.30	112.30	112.25	111.77	89.01	60.22
11.00	63.30	107.13	112.42	112.58	112.61	112.60	112.55	112.06	89.28	60.51
12.00	64.10	110.75	116.33	116.50	116.53	116.53	116.46	115.95	91.73	61.12
13.00	64.40	111.02	116.60	116.78	116.81	116.81	116.74	116.22	92.00	61.42
14.00	65.01	113.49	119.26	119.44	119.48	119.48	119.40	118.86	93.69	61.90
15.00	65.31	113.76	119.54	119.73	119.77	119.76	119.68	119.13	93.95	62.16
16.00	65.82	115.37	121.27	121.47	121.51	121.51	121.42	120.85	95.08	62.55
17.00	66.11	115.64	121.54	121.75	121.79	121.79	121.70	121.12	95.36	62.89
18.00	66.45	116.45	122.39	122.60	122.65	122.65	122.55	121.96	95.97	63.23
19.00	66.74	116.72	122.66	122.88	122.93	122.93	122.82	122.23	96.24	63.47
20.00	67.25	118.54	124.60	124.83	124.89	124.88	124.77	124.17	97.58	63.85
21.00	67.52	118.78	124.86	125.09	125.15	125.14	125.02	124.41	97.85	64.09
22.00	60.79	66.18	68.02	68.23	68.30	68.30	68.15	67.60	63.48	59.87
22.50	58.60	58.79	59.14	59.31	59.39	59.38	59.23	58.97	58.62	58.27

Table B - 10. Temperature (°C) map of the west side of plate 3TT at MOC2 143B (38.0 EFPD).

Length of Plate (in)	Width of Plate (inches)									
	0.05	0.25	0.50	0.75	1.00	1.25	1.50	1.75	2.00	2.24
0.125	51.98	51.78	51.77	51.77	51.77	51.77	51.77	51.77	51.80	51.97
1.00	53.29	52.58	52.78	52.80	52.80	52.80	52.79	52.71	52.50	53.09
2.00	58.27	84.87	88.14	88.21	88.22	88.22	88.21	87.93	73.41	56.28
3.00	58.72	85.19	88.48	88.56	88.57	88.57	88.55	88.26	73.75	56.67
4.00	59.98	91.51	95.29	95.38	95.39	95.39	95.37	95.05	78.14	57.56
5.00	60.31	91.75	95.53	95.63	95.64	95.64	95.61	95.29	78.40	57.86
6.00	61.49	97.38	101.70	101.82	101.83	101.83	101.80	101.41	82.38	58.65
7.00	61.86	97.65	102.03	102.15	102.17	102.17	102.13	101.73	82.67	58.96
8.00	62.94	102.65	107.57	107.70	107.72	107.72	107.68	107.24	86.10	59.72
9.00	63.26	102.93	107.86	108.00	108.02	108.02	107.97	107.52	86.38	60.16
10.00	64.18	107.12	112.38	112.54	112.56	112.56	112.51	112.03	89.20	60.77
11.00	64.54	107.45	112.72	112.88	112.91	112.91	112.85	112.36	89.51	61.05
12.00	65.41	111.11	116.67	116.83	116.86	116.86	116.80	116.29	91.99	61.66
13.00	65.72	111.41	116.98	117.15	117.18	117.18	117.11	116.59	92.28	61.98
14.00	66.37	113.92	119.67	119.85	119.89	119.88	119.81	119.27	94.00	62.48
15.00	66.69	114.23	119.98	120.17	120.21	120.21	120.13	119.58	94.29	62.73
16.00	67.22	115.88	121.75	121.95	121.99	121.99	121.90	121.34	95.47	63.11
17.00	67.53	116.19	122.06	122.26	122.31	122.30	122.21	121.65	95.78	63.53
18.00	67.89	117.03	122.94	123.15	123.20	123.20	123.10	122.53	96.46	63.89
19.00	68.19	117.33	123.25	123.47	123.52	123.51	123.41	122.83	96.78	64.12
20.00	68.74	119.19	125.23	125.45	125.51	125.50	125.40	124.80	98.16	64.46
21.00	69.01	119.48	125.52	125.74	125.80	125.80	125.68	125.08	98.46	64.69
22.00	61.65	66.78	68.59	68.79	68.86	68.86	68.71	68.18	64.07	60.24
22.50	59.30	59.42	59.74	59.91	59.98	59.97	59.83	59.58	59.23	58.65

Table B - 11. Temperature (°C) map of the east side of plate 3BZ at MOC2 143B (38.0 EFPD).

Length of Plate (in)	Width of Plate (inches)									
	0.05	0.25	0.50	0.75	1.00	1.25	1.50	1.75	2.00	2.24
22.625	58.74	58.84	59.19	59.36	59.44	59.43	59.28	59.01	58.66	58.41
23.00	60.27	64.07	65.47	65.68	65.75	65.74	65.59	65.13	62.10	59.51
24.00	65.40	102.57	107.22	107.45	107.52	107.51	107.38	106.84	87.31	62.85
25.00	65.61	102.80	107.45	107.69	107.76	107.75	107.61	107.07	87.54	63.06
26.00	65.73	102.51	107.12	107.36	107.43	107.43	107.28	106.73	87.43	63.24
27.00	65.90	102.71	107.32	107.57	107.64	107.64	107.49	106.94	87.63	63.42
28.00	66.00	102.36	106.92	107.17	107.25	107.24	107.09	106.54	87.46	63.51
29.00	66.16	102.58	107.14	107.39	107.47	107.47	107.31	106.76	87.66	63.63
30.00	66.21	102.01	106.50	106.76	106.84	106.84	106.67	106.12	87.35	63.70
31.00	66.34	102.20	106.69	106.95	107.03	107.03	106.86	106.31	87.53	63.85
32.00	66.27	100.94	105.30	105.56	105.65	105.64	105.47	104.92	86.78	63.85
33.00	66.40	101.14	105.50	105.77	105.85	105.85	105.67	105.12	86.96	63.94
34.00	66.31	99.80	104.03	104.29	104.38	104.38	104.20	103.65	86.15	63.92
35.00	66.41	99.97	104.20	104.47	104.56	104.55	104.37	103.82	86.31	64.05
36.00	66.12	97.49	101.49	101.76	101.85	101.84	101.66	101.12	84.77	63.91
37.00	66.20	97.67	101.66	101.93	102.02	102.02	101.83	101.30	84.92	63.96
38.00	65.92	95.35	99.13	99.39	99.49	99.48	99.30	98.77	83.46	63.77
39.00	65.98	95.49	99.26	99.53	99.63	99.62	99.43	98.91	83.59	63.81
40.00	65.48	91.72	95.13	95.40	95.50	95.49	95.30	94.79	81.20	63.52
41.00	65.49	91.83	95.23	95.50	95.60	95.59	95.40	94.90	81.29	63.53
42.00	64.87	87.60	90.48	90.73	90.83	90.83	90.63	90.18	78.51	63.11
43.00	64.84	87.68	90.54	90.81	90.91	90.90	90.70	90.25	78.58	63.08
44.00	61.61	63.62	64.19	64.44	64.55	64.54	64.33	63.97	63.10	60.96
45.00	61.02	63.10	63.52	63.75	63.86	63.85	63.64	63.35	62.68	60.48

Table B - 12. Temperature (°C) map of the west side of plate 3BZ at MOC2 143B (38.0 EFPD).

Length of Plate (in)	Width of Plate (inches)									
	0.05	0.25	0.50	0.75	1.00	1.25	1.50	1.75	2.00	2.24
22.625	59.40	59.47	59.79	59.96	60.03	60.03	59.88	59.62	59.28	58.74
23.00	61.11	64.69	66.07	66.27	66.34	66.33	66.18	65.73	62.72	59.88
24.00	66.79	103.38	108.00	108.22	108.28	108.27	108.15	107.62	87.94	63.44
25.00	67.02	103.64	108.26	108.48	108.55	108.54	108.41	107.88	88.20	63.66
26.00	67.15	103.38	107.96	108.19	108.25	108.25	108.11	107.58	88.11	63.90
27.00	67.33	103.62	108.20	108.43	108.50	108.49	108.35	107.82	88.34	64.10
28.00	67.43	103.31	107.84	108.07	108.14	108.14	107.99	107.46	88.21	64.17
29.00	67.61	103.57	108.09	108.33	108.40	108.40	108.25	107.71	88.44	64.25
30.00	67.65	103.04	107.50	107.74	107.81	107.81	107.65	107.12	88.16	64.32
31.00	67.79	103.26	107.72	107.96	108.04	108.03	107.88	107.34	88.37	64.48
32.00	67.72	102.04	106.37	106.62	106.70	106.69	106.53	106.00	87.65	64.48
33.00	67.85	102.28	106.62	106.86	106.94	106.93	106.77	106.24	87.87	64.56
34.00	67.76	100.98	105.18	105.43	105.51	105.51	105.34	104.81	87.09	64.55
35.00	67.86	101.19	105.39	105.64	105.72	105.72	105.55	105.02	87.29	64.72
36.00	67.54	98.77	102.73	102.98	103.06	103.06	102.89	102.37	85.78	64.59
37.00	67.63	98.98	102.95	103.20	103.28	103.28	103.10	102.58	85.97	64.62
38.00	67.33	96.72	100.46	100.71	100.80	100.79	100.61	100.10	84.55	64.39
39.00	67.39	96.89	100.63	100.89	100.97	100.97	100.79	100.28	84.71	64.42
40.00	66.84	93.17	96.55	96.81	96.89	96.89	96.71	96.21	82.36	64.13
41.00	66.84	93.31	96.70	96.95	97.04	97.03	96.85	96.36	82.48	64.14
42.00	66.17	89.05	91.99	92.24	92.33	92.32	92.14	91.68	79.77	63.68
43.00	66.13	89.16	92.10	92.35	92.44	92.43	92.25	91.79	79.86	63.65
44.00	62.41	64.86	65.43	65.66	65.77	65.76	65.55	65.20	64.32	61.33
45.00	61.73	64.35	64.77	64.99	65.09	65.08	64.87	64.59	63.91	60.81

Table B - 13. Temperature (°C) map of the east side of plate 3TT at EOC 143B (57.3 EFPD).

Length of Plate (in)	Width of Plate (inches)									
	0.05	0.25	0.50	0.75	1.00	1.25	1.50	1.75	2.00	2.24
0.125	51.94	51.78	51.77	51.77	51.77	51.77	51.77	51.77	51.80	51.94
1.00	53.01	52.49	52.67	52.69	52.69	52.69	52.68	52.61	52.44	52.91
2.00	57.00	81.51	84.50	84.57	84.57	84.57	84.56	84.30	71.15	55.60
3.00	57.37	81.77	84.79	84.86	84.87	84.87	84.85	84.58	71.44	55.94
4.00	58.32	86.85	90.27	90.35	90.36	90.36	90.35	90.04	74.94	56.65
5.00	58.59	87.04	90.46	90.55	90.56	90.56	90.54	90.23	75.15	56.91
6.00	59.36	90.67	94.37	94.46	94.47	94.47	94.45	94.12	77.70	57.47
7.00	59.66	90.87	94.58	94.67	94.69	94.69	94.66	94.33	77.93	57.75
8.00	60.37	93.94	97.87	97.97	97.99	97.99	97.96	97.61	80.12	58.29
9.00	60.63	94.12	98.05	98.16	98.18	98.17	98.14	97.79	80.34	58.61
10.00	61.20	96.38	100.57	100.69	100.72	100.71	100.67	100.26	81.97	59.04
11.00	61.49	96.59	100.81	100.95	100.97	100.97	100.92	100.50	82.20	59.29
12.00	61.97	98.18	102.64	102.79	102.81	102.81	102.76	102.32	83.38	59.68
13.00	62.23	98.36	102.86	103.01	103.04	103.04	102.98	102.54	83.61	59.95
14.00	62.65	99.79	104.41	104.57	104.60	104.60	104.53	104.08	84.62	60.30
15.00	62.90	100.01	104.63	104.80	104.83	104.83	104.76	104.30	84.83	60.52
16.00	63.17	100.25	104.87	105.04	105.08	105.07	105.00	104.53	85.05	60.75
17.00	63.40	100.46	105.08	105.26	105.30	105.30	105.21	104.74	85.28	61.04
18.00	63.61	100.53	105.15	105.33	105.37	105.37	105.28	104.80	85.40	61.27
19.00	63.83	100.74	105.36	105.54	105.59	105.59	105.50	105.01	85.60	61.47
20.00	64.15	101.47	106.14	106.33	106.37	106.37	106.27	105.78	86.14	61.70
21.00	64.34	101.66	106.33	106.52	106.57	106.57	106.47	105.97	86.33	61.89
22.00	59.42	62.86	64.20	64.37	64.43	64.42	64.30	63.89	60.93	58.77
22.50	57.81	57.46	57.68	57.82	57.88	57.87	57.75	57.56	57.40	57.61

Table B - 14. Temperature (°C) map of the west side of plate 3TT at EOC 143B (57.3 EFPD).

Length of Plate (in)	Width of Plate (inches)									
	0.05	0.25	0.50	0.75	1.00	1.25	1.50	1.75	2.00	2.24
0.125	51.98	51.78	51.77	51.77	51.77	51.77	51.77	51.77	51.80	51.97
1.00	53.22	52.50	52.67	52.69	52.69	52.69	52.69	52.61	52.44	53.03
2.00	57.75	81.52	84.51	84.58	84.58	84.58	84.57	84.31	71.15	55.94
3.00	58.16	81.81	84.82	84.89	84.90	84.90	84.89	84.61	71.45	56.31
4.00	59.22	86.91	90.33	90.41	90.42	90.42	90.40	90.10	74.98	57.07
5.00	59.52	87.13	90.54	90.63	90.64	90.64	90.62	90.31	75.21	57.34
6.00	60.37	90.78	94.48	94.57	94.58	94.58	94.56	94.23	77.79	57.93
7.00	60.70	91.03	94.72	94.82	94.84	94.83	94.81	94.47	78.05	58.21
8.00	61.49	94.13	98.05	98.15	98.17	98.17	98.14	97.79	80.27	58.77
9.00	61.77	94.34	98.26	98.37	98.39	98.39	98.35	98.00	80.52	59.18
10.00	62.39	96.63	100.85	100.98	101.00	101.00	100.95	100.55	82.19	59.60
11.00	62.71	96.88	101.14	101.27	101.30	101.30	101.25	100.83	82.45	59.84
12.00	63.23	98.52	103.00	103.15	103.18	103.18	103.12	102.69	83.66	60.24
13.00	63.51	98.78	103.26	103.42	103.45	103.44	103.38	102.94	83.91	60.52
14.00	63.96	100.25	104.85	105.01	105.04	105.04	104.97	104.52	84.95	60.89
15.00	64.24	100.51	105.12	105.28	105.31	105.31	105.24	104.78	85.20	61.10
16.00	64.53	100.79	105.39	105.56	105.60	105.60	105.52	105.05	85.46	61.32
17.00	64.78	101.04	105.65	105.82	105.86	105.86	105.78	105.31	85.72	61.69
18.00	65.00	101.16	105.76	105.94	105.98	105.97	105.89	105.41	85.87	61.95
19.00	65.24	101.41	106.01	106.19	106.23	106.23	106.14	105.66	86.11	62.13
20.00	65.58	102.18	106.82	107.01	107.06	107.06	106.96	106.47	86.68	62.33
21.00	65.79	102.41	107.05	107.24	107.29	107.29	107.19	106.69	86.90	62.51
22.00	60.30	63.47	64.80	64.97	65.02	65.02	64.90	64.49	61.54	59.17
22.50	58.53	58.10	58.31	58.44	58.50	58.49	58.38	58.19	58.02	57.99

Table B - 15. Temperature (°C) map of the east side of plate 3BZ at EOC 143B (57.3 EFPD).

Length of Plate (in)	Width of Plate (inches)									
	0.05	0.25	0.50	0.75	1.00	1.25	1.50	1.75	2.00	2.24
22.625	57.92	57.49	57.72	57.85	57.92	57.91	57.79	57.60	57.43	57.71
23.00	59.07	61.36	62.37	62.53	62.59	62.59	62.47	62.12	59.97	58.55
24.00	62.91	90.09	93.46	93.63	93.68	93.67	93.57	93.19	78.70	61.08
25.00	63.10	90.30	93.67	93.84	93.89	93.89	93.79	93.39	78.92	61.27
26.00	63.26	90.50	93.88	94.05	94.11	94.10	94.00	93.60	79.13	61.47
27.00	63.40	90.65	94.03	94.21	94.26	94.26	94.15	93.75	79.29	61.62
28.00	63.50	90.54	93.89	94.08	94.13	94.13	94.02	93.61	79.27	61.71
29.00	63.64	90.70	94.06	94.24	94.30	94.29	94.18	93.77	79.43	61.81
30.00	63.71	90.52	93.85	94.04	94.10	94.09	93.97	93.57	79.36	61.89
31.00	63.82	90.65	93.99	94.18	94.23	94.22	94.11	93.71	79.51	62.02
32.00	63.85	90.24	93.53	93.72	93.78	93.78	93.66	93.25	79.29	62.07
33.00	63.95	90.40	93.68	93.88	93.93	93.93	93.81	93.40	79.44	62.14
34.00	63.97	90.01	93.25	93.44	93.51	93.50	93.38	92.97	79.23	62.19
35.00	64.05	90.14	93.38	93.58	93.64	93.63	93.51	93.10	79.37	62.30
36.00	63.92	88.99	92.12	92.32	92.38	92.38	92.25	91.84	78.64	62.26
37.00	63.99	89.12	92.26	92.46	92.53	92.52	92.39	91.98	78.77	62.30
38.00	63.88	88.12	91.16	91.36	91.43	91.42	91.29	90.89	78.14	62.21
39.00	63.92	88.23	91.28	91.48	91.55	91.54	91.40	91.00	78.25	62.24
40.00	63.60	85.88	88.70	88.89	88.96	88.96	88.82	88.43	76.71	62.06
41.00	63.60	85.97	88.79	88.99	89.06	89.05	88.91	88.52	76.80	62.06
42.00	63.14	82.88	85.42	85.62	85.69	85.69	85.54	85.17	74.77	61.74
43.00	63.11	82.95	85.49	85.68	85.76	85.75	85.61	85.24	74.83	61.71
44.00	60.20	61.43	61.87	62.07	62.15	62.15	61.98	61.70	61.05	59.78
45.00	59.66	60.96	61.26	61.45	61.53	61.52	61.36	61.14	60.67	59.34

Table B - 16. Temperature (°C) map of the west side of plate 3BZ at EOC 143B (57.3 EFPD).

Length of Plate (in)	Width of Plate (inches)									
	0.05	0.25	0.50	0.75	1.00	1.25	1.50	1.75	2.00	2.24
22.625	58.61	58.14	58.35	58.48	58.54	58.53	58.42	58.23	58.06	58.06
23.00	59.93	61.99	63.00	63.15	63.21	63.21	63.09	62.74	60.59	58.94
24.00	64.29	90.86	94.19	94.37	94.42	94.42	94.31	93.94	79.38	61.70
25.00	64.50	91.09	94.46	94.64	94.69	94.69	94.58	94.17	79.62	61.90
26.00	64.67	91.33	94.72	94.90	94.96	94.95	94.84	94.42	79.86	62.16
27.00	64.82	91.51	94.92	95.10	95.16	95.16	95.04	94.63	80.06	62.34
28.00	64.94	91.44	94.83	95.01	95.07	95.07	94.95	94.53	80.07	62.41
29.00	65.09	91.63	95.05	95.24	95.30	95.29	95.17	94.75	80.26	62.47
30.00	65.16	91.49	94.88	95.07	95.13	95.13	95.00	94.58	80.23	62.55
31.00	65.28	91.66	95.07	95.26	95.32	95.32	95.20	94.77	80.41	62.69
32.00	65.31	91.29	94.65	94.84	94.90	94.90	94.77	94.35	80.22	62.74
33.00	65.42	91.48	94.86	95.05	95.12	95.11	94.98	94.56	80.41	62.80
34.00	65.45	91.13	94.45	94.65	94.72	94.71	94.58	94.16	80.23	62.86
35.00	65.53	91.30	94.64	94.84	94.90	94.90	94.77	94.34	80.40	63.01
36.00	65.39	90.20	93.39	93.59	93.65	93.65	93.51	93.09	79.71	62.99
37.00	65.45	90.37	93.58	93.78	93.85	93.85	93.71	93.29	79.88	63.01
38.00	65.34	89.42	92.50	92.70	92.77	92.76	92.62	92.21	79.28	62.88
39.00	65.38	89.56	92.66	92.87	92.94	92.93	92.79	92.37	79.42	62.90
40.00	65.01	87.26	90.07	90.27	90.34	90.33	90.19	89.80	77.93	62.71
41.00	65.01	87.39	90.20	90.40	90.48	90.47	90.32	89.93	78.05	62.72
42.00	64.50	84.36	86.90	87.09	87.16	87.15	87.01	86.64	76.07	62.35
43.00	64.46	84.46	87.00	87.19	87.26	87.25	87.11	86.74	76.15	62.32
44.00	61.06	62.70	63.15	63.34	63.42	63.41	63.25	62.97	62.29	60.19
45.00	60.43	62.24	62.55	62.73	62.81	62.80	62.64	62.41	61.92	59.71

Table B - 17. Temperature (°C) map of the east side of plate 3TT at BOC 144A (57.3 EFPD).

Length of Plate (in)	Width of Plate (inches)									
	0.05	0.25	0.50	0.75	1.00	1.25	1.50	1.75	2.00	2.24
0.125	51.92	51.77	51.76	51.76	51.76	51.76	51.76	51.76	51.79	51.92
1.00	52.84	52.41	52.58	52.59	52.60	52.60	52.59	52.52	52.35	52.74
2.00	56.28	78.92	81.71	81.78	81.79	81.79	81.78	81.52	69.32	54.97
3.00	56.61	79.18	82.00	82.07	82.08	82.08	82.06	81.80	69.59	55.28
4.00	57.63	85.23	88.55	88.63	88.64	88.64	88.62	88.33	73.72	56.00
5.00	57.88	85.40	88.73	88.81	88.82	88.82	88.80	88.50	73.91	56.23
6.00	58.68	89.53	93.18	93.27	93.28	93.28	93.26	92.93	76.78	56.80
7.00	58.95	89.72	93.38	93.47	93.48	93.48	93.46	93.13	76.99	57.06
8.00	59.76	93.69	97.64	97.74	97.76	97.75	97.73	97.38	79.78	57.64
9.00	59.99	93.86	97.81	97.92	97.93	97.93	97.90	97.55	79.98	57.92
10.00	60.67	96.91	101.20	101.33	101.35	101.35	101.31	100.90	82.16	58.41
11.00	60.94	97.11	101.44	101.57	101.60	101.60	101.55	101.13	82.38	58.65
12.00	61.49	99.32	103.98	104.12	104.14	104.14	104.09	103.65	83.98	59.07
13.00	61.72	99.53	104.19	104.34	104.37	104.37	104.31	103.86	84.18	59.31
14.00	62.18	101.33	106.14	106.29	106.32	106.32	106.26	105.79	85.43	59.68
15.00	62.42	101.55	106.36	106.52	106.55	106.55	106.48	106.01	85.63	59.89
16.00	62.93	103.54	108.51	108.68	108.71	108.71	108.64	108.15	87.00	60.27
17.00	63.17	103.76	108.73	108.91	108.95	108.94	108.87	108.37	87.23	60.55
18.00	63.49	104.71	109.74	109.93	109.97	109.96	109.88	109.38	87.91	60.84
19.00	63.72	104.93	109.97	110.16	110.20	110.20	110.11	109.60	88.12	61.04
20.00	64.10	106.22	111.35	111.54	111.59	111.59	111.49	110.97	89.03	61.32
21.00	64.30	106.42	111.55	111.75	111.80	111.79	111.70	111.17	89.22	61.51
22.00	58.97	63.14	64.64	64.81	64.86	64.86	64.74	64.30	60.95	58.24
22.50	57.26	57.07	57.32	57.44	57.50	57.49	57.38	57.19	56.99	57.02

Table B - 18. Temperature (°C) map of the west side of plate 3TT at BOC 144A (57.3 EFPD).

Length of Plate (in)	Width of Plate (inches)									
	0.05	0.25	0.50	0.75	1.00	1.25	1.50	1.75	2.00	2.24
0.125	51.95	51.77	51.76	51.76	51.76	51.76	51.76	51.76	51.79	51.95
1.00	52.97	52.41	52.58	52.59	52.60	52.60	52.59	52.52	52.35	52.81
2.00	56.58	78.92	81.71	81.78	81.78	81.78	81.77	81.52	69.31	55.06
3.00	56.94	79.18	82.00	82.07	82.07	82.07	82.06	81.79	69.58	55.37
4.00	58.01	85.23	88.55	88.63	88.63	88.63	88.62	88.32	73.71	56.11
5.00	58.27	85.41	88.72	88.81	88.81	88.81	88.80	88.50	73.90	56.35
6.00	59.11	89.53	93.17	93.26	93.27	93.27	93.25	92.93	76.77	56.92
7.00	59.40	89.73	93.37	93.46	93.47	93.47	93.45	93.12	76.98	57.17
8.00	60.24	93.70	97.63	97.73	97.74	97.74	97.72	97.38	79.77	57.76
9.00	60.49	93.87	97.81	97.91	97.92	97.92	97.89	97.55	79.98	58.09
10.00	61.20	96.91	101.19	101.32	101.33	101.33	101.30	100.90	82.16	58.59
11.00	61.48	97.12	101.43	101.56	101.58	101.57	101.54	101.13	82.38	58.81
12.00	62.05	99.34	103.97	104.10	104.12	104.12	104.08	103.65	83.97	59.22
13.00	62.30	99.55	104.18	104.32	104.34	104.34	104.30	103.86	84.18	59.47
14.00	62.77	101.35	106.13	106.27	106.29	106.29	106.24	105.79	85.43	59.85
15.00	63.02	101.57	106.34	106.49	106.52	106.52	106.46	106.01	85.63	60.05
16.00	63.55	103.56	108.50	108.65	108.68	108.68	108.62	108.15	87.01	60.42
17.00	63.79	103.79	108.72	108.88	108.91	108.91	108.85	108.37	87.23	60.75
18.00	64.11	104.73	109.73	109.89	109.92	109.92	109.86	109.37	87.92	61.06
19.00	64.35	104.95	109.95	110.12	110.16	110.15	110.08	109.60	88.13	61.25
20.00	64.73	106.24	111.33	111.51	111.54	111.54	111.47	110.97	89.04	61.50
21.00	64.94	106.44	111.53	111.71	111.75	111.74	111.67	111.17	89.23	61.68
22.00	59.34	63.16	64.62	64.77	64.82	64.81	64.72	64.30	60.98	58.37
22.50	57.60	57.10	57.30	57.41	57.46	57.45	57.36	57.19	57.03	57.21

Table B - 19. Temperature (°C) map of the east side of plate 3BZ at BOC 144A (57.3 EFPD).

Length of Plate (in)	Width of Plate (inches)									
	0.05	0.25	0.50	0.75	1.00	1.25	1.50	1.75	2.00	2.24
22.625	57.37	57.11	57.35	57.48	57.54	57.54	57.42	57.22	57.02	57.12
23.00	58.56	61.44	62.58	62.74	62.80	62.79	62.68	62.31	59.85	57.97
24.00	62.63	93.47	97.24	97.43	97.49	97.48	97.37	96.93	80.76	60.54
25.00	62.79	93.61	97.41	97.60	97.66	97.66	97.54	97.09	80.94	60.69
26.00	62.85	93.21	96.95	97.15	97.21	97.21	97.09	96.63	80.73	60.81
27.00	62.97	93.36	97.12	97.32	97.38	97.37	97.25	96.80	80.89	60.94
28.00	63.06	93.20	96.93	97.14	97.20	97.20	97.07	96.61	80.83	61.02
29.00	63.18	93.35	97.11	97.31	97.38	97.37	97.25	96.78	80.98	61.11
30.00	63.23	93.08	96.80	97.01	97.07	97.07	96.94	96.48	80.85	61.18
31.00	63.33	93.21	96.95	97.16	97.22	97.22	97.09	96.62	80.99	61.28
32.00	63.24	92.10	95.67	95.88	95.95	95.95	95.81	95.35	80.28	61.25
33.00	63.32	92.24	95.83	96.04	96.11	96.11	95.97	95.51	80.42	61.31
34.00	63.22	91.16	94.60	94.81	94.88	94.88	94.74	94.28	79.73	61.27
35.00	63.28	91.28	94.73	94.95	95.02	95.01	94.87	94.42	79.85	61.35
36.00	63.08	89.63	92.88	93.08	93.15	93.14	93.01	92.60	78.78	61.25
37.00	63.12	89.75	93.00	93.20	93.27	93.27	93.13	92.72	78.89	61.28
38.00	62.80	87.38	90.43	90.63	90.70	90.70	90.56	90.16	77.33	61.06
39.00	62.82	87.47	90.52	90.72	90.79	90.79	90.65	90.25	77.42	61.07
40.00	62.49	85.06	87.90	88.10	88.17	88.16	88.02	87.63	75.84	60.87
41.00	62.48	85.13	87.97	88.17	88.24	88.24	88.10	87.70	75.91	60.86
42.00	61.94	81.52	84.03	84.23	84.30	84.30	84.16	83.78	73.53	60.50
43.00	61.90	81.57	84.08	84.28	84.35	84.35	84.20	83.82	73.57	60.46
44.00	59.28	60.63	61.07	61.26	61.34	61.34	61.17	60.90	60.26	58.80
45.00	58.81	60.17	60.47	60.64	60.72	60.72	60.56	60.34	59.89	58.42

Table B - 20. Temperature (°C) map of the west side of plate 3BZ at BOC 144A (57.3 EFPD).

Length of Plate (in)	Width of Plate (inches)									
	0.05	0.25	0.50	0.75	1.00	1.25	1.50	1.75	2.00	2.24
22.625	57.66	57.13	57.34	57.45	57.50	57.49	57.40	57.22	57.06	57.27
23.00	58.91	61.46	62.57	62.71	62.75	62.75	62.65	62.31	59.88	58.09
24.00	63.17	93.49	97.22	97.38	97.42	97.42	97.34	96.93	80.78	60.69
25.00	63.32	93.63	97.39	97.55	97.59	97.59	97.50	97.09	80.96	60.84
26.00	63.38	93.23	96.93	97.10	97.14	97.14	97.05	96.63	80.75	60.99
27.00	63.50	93.38	97.09	97.26	97.31	97.30	97.21	96.79	80.90	61.13
28.00	63.57	93.22	96.91	97.08	97.13	97.12	97.03	96.61	80.85	61.19
29.00	63.68	93.37	97.08	97.25	97.30	97.30	97.20	96.78	81.00	61.25
30.00	63.73	93.10	96.77	96.95	96.99	96.99	96.89	96.47	80.87	61.31
31.00	63.81	93.23	96.92	97.09	97.14	97.14	97.04	96.61	81.01	61.41
32.00	63.70	92.12	95.64	95.82	95.87	95.86	95.76	95.34	80.30	61.37
33.00	63.77	92.26	95.80	95.97	96.02	96.02	95.91	95.50	80.43	61.42
34.00	63.65	91.18	94.57	94.74	94.79	94.79	94.68	94.27	79.75	61.38
35.00	63.70	91.30	94.70	94.87	94.93	94.92	94.82	94.40	79.87	61.48
36.00	63.47	89.65	92.85	93.01	93.06	93.06	92.96	92.59	78.80	61.37
37.00	63.50	89.76	92.97	93.13	93.18	93.17	93.08	92.70	78.91	61.38
38.00	63.15	87.40	90.40	90.56	90.61	90.60	90.51	90.14	77.35	61.13
39.00	63.15	87.49	90.49	90.65	90.70	90.69	90.60	90.23	77.44	61.13
40.00	62.78	85.08	87.86	88.02	88.07	88.07	87.97	87.61	75.85	60.92
41.00	62.75	85.15	87.94	88.10	88.15	88.14	88.04	87.68	75.92	60.90
42.00	62.17	81.54	84.00	84.15	84.21	84.20	84.10	83.76	73.55	60.53
43.00	62.11	81.58	84.04	84.20	84.25	84.24	84.14	83.80	73.59	60.48
44.00	59.34	60.64	61.04	61.20	61.26	61.25	61.12	60.88	60.28	58.80
45.00	58.85	60.18	60.44	60.58	60.64	60.63	60.51	60.32	59.91	58.42

Table B - 21. Temperature (°C) map of the east side of plate 3TT at MOC1 144A (77.3 EFPD).

Length of Plate (in)	Width of Plate (inches)									
	0.05	0.25	0.50	0.75	1.00	1.25	1.50	1.75	2.00	2.24
0.125	51.92	51.77	51.76	51.76	51.76	51.76	51.76	51.76	51.79	51.92
1.00	52.87	52.44	52.61	52.63	52.63	52.63	52.63	52.55	52.37	52.77
2.00	56.45	80.08	82.98	83.04	83.05	83.05	83.04	82.78	70.10	55.09
3.00	56.77	80.33	83.25	83.32	83.33	83.32	83.31	83.04	70.36	55.38
4.00	57.61	85.09	88.40	88.48	88.49	88.49	88.47	88.18	73.63	55.99
5.00	57.86	85.26	88.57	88.66	88.67	88.67	88.65	88.35	73.81	56.22
6.00	58.64	89.28	92.91	93.00	93.01	93.01	92.99	92.67	76.61	56.78
7.00	58.91	89.47	93.11	93.20	93.21	93.21	93.19	92.86	76.82	57.03
8.00	59.62	92.80	96.68	96.78	96.80	96.79	96.77	96.42	79.17	57.54
9.00	59.84	92.96	96.85	96.95	96.97	96.97	96.94	96.59	79.36	57.82
10.00	60.40	95.24	99.29	99.41	99.43	99.43	99.39	99.02	81.01	58.23
11.00	60.66	95.43	99.51	99.64	99.66	99.66	99.62	99.21	81.21	58.46
12.00	61.09	96.92	101.22	101.36	101.38	101.38	101.33	100.91	82.31	58.81
13.00	61.31	97.09	101.42	101.57	101.59	101.59	101.54	101.11	82.50	59.03
14.00	61.73	98.60	103.16	103.32	103.34	103.34	103.28	102.83	83.62	59.38
15.00	61.96	98.80	103.37	103.53	103.56	103.56	103.49	103.04	83.81	59.58
16.00	62.26	99.39	104.00	104.16	104.19	104.19	104.12	103.66	84.26	59.82
17.00	62.47	99.59	104.20	104.36	104.40	104.40	104.32	103.85	84.47	60.08
18.00	62.72	100.09	104.73	104.90	104.94	104.94	104.86	104.38	84.86	60.32
19.00	62.92	100.29	104.93	105.11	105.15	105.15	105.07	104.58	85.05	60.50
20.00	63.21	101.00	105.69	105.87	105.92	105.91	105.82	105.33	85.58	60.72
21.00	63.39	101.18	105.86	106.05	106.10	106.10	106.00	105.51	85.74	60.89
22.00	58.63	62.23	63.58	63.74	63.79	63.79	63.68	63.27	60.28	57.97
22.50	57.10	56.80	57.01	57.13	57.18	57.18	57.07	56.89	56.74	56.89

Table B - 22. Temperature (°C) map of the west side of plate 3TT at MOC1 144A (77.3 EFPD).

Length of Plate (in)	Width of Plate (inches)									
	0.05	0.25	0.50	0.75	1.00	1.25	1.50	1.75	2.00	2.24
0.125	51.95	51.77	51.76	51.76	51.76	51.76	51.76	51.76	51.79	51.95
1.00	52.99	52.44	52.61	52.63	52.63	52.63	52.63	52.55	52.37	52.83
2.00	56.77	80.08	82.97	83.04	83.05	83.05	83.04	82.78	70.09	55.18
3.00	57.11	80.33	83.24	83.32	83.32	83.32	83.31	83.04	70.35	55.48
4.00	57.99	85.10	88.40	88.48	88.48	88.48	88.47	88.17	73.62	56.10
5.00	58.25	85.27	88.57	88.65	88.66	88.66	88.64	88.34	73.80	56.34
6.00	59.07	89.29	92.91	93.00	93.00	93.00	92.99	92.67	76.60	56.90
7.00	59.36	89.48	93.10	93.19	93.20	93.20	93.18	92.86	76.81	57.14
8.00	60.09	92.80	96.68	96.77	96.78	96.78	96.76	96.42	79.16	57.66
9.00	60.34	92.97	96.84	96.94	96.96	96.95	96.93	96.59	79.36	58.00
10.00	60.92	95.25	99.28	99.40	99.41	99.41	99.38	99.02	81.00	58.41
11.00	61.19	95.44	99.51	99.63	99.64	99.64	99.61	99.21	81.21	58.61
12.00	61.64	96.93	101.21	101.34	101.36	101.36	101.32	100.91	82.31	58.95
13.00	61.87	97.10	101.41	101.55	101.57	101.57	101.52	101.11	82.51	59.20
14.00	62.31	98.62	103.15	103.29	103.32	103.31	103.27	102.83	83.62	59.54
15.00	62.54	98.82	103.36	103.50	103.53	103.53	103.47	103.04	83.82	59.73
16.00	62.84	99.41	103.98	104.13	104.16	104.16	104.10	103.65	84.27	59.96
17.00	63.06	99.61	104.18	104.33	104.36	104.36	104.30	103.85	84.47	60.27
18.00	63.31	100.12	104.72	104.87	104.90	104.90	104.84	104.38	84.87	60.53
19.00	63.52	100.32	104.92	105.08	105.11	105.11	105.04	104.58	85.06	60.71
20.00	63.82	101.03	105.67	105.83	105.87	105.87	105.80	105.33	85.59	60.89
21.00	64.00	101.20	105.85	106.01	106.05	106.05	105.97	105.50	85.76	61.05
22.00	58.99	62.25	63.57	63.71	63.75	63.74	63.65	63.27	60.31	58.10
22.50	57.43	56.82	56.99	57.09	57.14	57.13	57.05	56.89	56.77	57.07

Table B - 23. Temperature (°C) map of the east side of plate 3BZ at MOC1 144A (77.3 EFPD).

Length of Plate (in)	Width of Plate (inches)									
	0.05	0.25	0.50	0.75	1.00	1.25	1.50	1.75	2.00	2.24
22.625	57.20	56.83	57.04	57.16	57.22	57.21	57.11	56.92	56.77	56.97
23.00	58.25	60.67	61.68	61.83	61.89	61.88	61.77	61.43	59.27	57.72
24.00	61.86	89.34	92.72	92.88	92.92	92.92	92.83	92.44	77.87	60.00
25.00	62.02	89.51	92.89	93.06	93.11	93.10	93.01	92.62	78.06	60.16
26.00	62.14	89.60	92.97	93.14	93.19	93.19	93.09	92.70	78.18	60.31
27.00	62.26	89.73	93.11	93.28	93.33	93.32	93.22	92.83	78.33	60.43
28.00	62.36	89.76	93.13	93.30	93.35	93.35	93.25	92.85	78.39	60.52
29.00	62.47	89.91	93.27	93.45	93.50	93.50	93.39	93.00	78.54	60.61
30.00	62.56	89.90	93.25	93.43	93.48	93.48	93.37	92.98	78.58	60.69
31.00	62.64	90.02	93.37	93.55	93.61	93.60	93.49	93.10	78.71	60.78
32.00	62.60	89.24	92.52	92.70	92.76	92.76	92.64	92.25	78.23	60.78
33.00	62.68	89.37	92.65	92.83	92.89	92.89	92.77	92.38	78.36	60.84
34.00	62.64	88.80	92.02	92.21	92.27	92.26	92.15	91.75	78.01	60.84
35.00	62.70	88.91	92.14	92.32	92.38	92.38	92.26	91.86	78.13	60.92
36.00	62.55	87.65	90.76	90.94	91.00	91.00	90.88	90.49	77.31	60.85
37.00	62.60	87.76	90.87	91.06	91.12	91.12	91.00	90.60	77.42	60.88
38.00	62.42	86.43	89.42	89.61	89.67	89.67	89.54	89.15	76.56	60.75
39.00	62.44	86.52	89.52	89.70	89.77	89.77	89.64	89.25	76.65	60.77
40.00	62.17	84.51	87.32	87.51	87.58	87.57	87.44	87.06	75.33	60.60
41.00	62.16	84.59	87.40	87.59	87.65	87.65	87.52	87.14	75.40	60.59
42.00	61.64	81.08	83.57	83.76	83.83	83.83	83.69	83.32	73.10	60.25
43.00	61.60	81.13	83.62	83.81	83.88	83.87	83.74	83.37	73.14	60.20
44.00	58.97	60.14	60.57	60.74	60.82	60.81	60.66	60.40	59.80	58.54
45.00	58.50	59.68	59.96	60.12	60.20	60.19	60.04	59.84	59.44	58.16

Table B - 24. Temperature (°C) map of the west side of plate 3BZ at MOC1 144A (77.3 EFPD).

Length of Plate (in)	Width of Plate (inches)									
	0.05	0.25	0.50	0.75	1.00	1.25	1.50	1.75	2.00	2.24
22.625	57.49	56.85	57.03	57.13	57.17	57.17	57.08	56.92	56.80	57.13
23.00	58.59	60.69	61.67	61.80	61.84	61.84	61.75	61.43	59.30	57.84
24.00	62.37	89.36	92.70	92.83	92.87	92.87	92.80	92.44	77.89	60.15
25.00	62.53	89.53	92.87	93.01	93.05	93.05	92.97	92.62	78.08	60.31
26.00	62.64	89.62	92.95	93.09	93.13	93.13	93.05	92.69	78.20	60.49
27.00	62.76	89.75	93.08	93.23	93.26	93.26	93.19	92.82	78.34	60.62
28.00	62.85	89.78	93.11	93.25	93.29	93.28	93.21	92.85	78.41	60.69
29.00	62.96	89.92	93.25	93.39	93.43	93.43	93.35	92.99	78.55	60.75
30.00	63.03	89.91	93.23	93.37	93.41	93.41	93.33	92.96	78.59	60.82
31.00	63.11	90.03	93.35	93.49	93.53	93.53	93.45	93.08	78.72	60.91
32.00	63.05	89.26	92.50	92.64	92.68	92.68	92.60	92.23	78.24	60.90
33.00	63.12	89.39	92.62	92.77	92.81	92.81	92.73	92.36	78.37	60.95
34.00	63.07	88.81	91.99	92.14	92.19	92.18	92.10	91.73	78.02	60.95
35.00	63.11	88.93	92.11	92.26	92.30	92.29	92.21	91.85	78.14	61.04
36.00	62.94	87.66	90.72	90.88	90.92	90.91	90.83	90.47	77.33	60.97
37.00	62.97	87.77	90.84	90.99	91.03	91.03	90.94	90.58	77.44	60.98
38.00	62.77	86.44	89.39	89.54	89.58	89.58	89.49	89.13	76.57	60.83
39.00	62.77	86.54	89.48	89.63	89.68	89.67	89.58	89.23	76.66	60.83
40.00	62.46	84.52	87.29	87.44	87.48	87.48	87.38	87.04	75.34	60.66
41.00	62.44	84.60	87.36	87.51	87.56	87.55	87.46	87.11	75.41	60.64
42.00	61.87	81.09	83.53	83.68	83.73	83.73	83.63	83.30	73.11	60.27
43.00	61.81	81.13	83.58	83.73	83.78	83.77	83.68	83.35	73.15	60.23
44.00	59.04	60.15	60.53	60.67	60.74	60.73	60.61	60.38	59.82	58.55
45.00	58.55	59.69	59.93	60.05	60.11	60.10	59.99	59.82	59.45	58.16

Table B - 25. Temperature (°C) map of the east side of plate 3TT at MOC2 144A (92.1 EFPD).

Length of Plate (in)	Width of Plate (inches)									
	0.05	0.25	0.50	0.75	1.00	1.25	1.50	1.75	2.00	2.24
0.125	51.92	51.77	51.76	51.76	51.76	51.76	51.76	51.76	51.79	51.92
1.00	52.88	52.45	52.63	52.65	52.65	52.65	52.65	52.57	52.38	52.78
2.00	56.54	80.64	83.58	83.65	83.65	83.65	83.64	83.38	70.48	55.14
3.00	56.86	80.88	83.85	83.92	83.93	83.93	83.91	83.64	70.74	55.44
4.00	57.65	85.29	88.61	88.69	88.70	88.70	88.68	88.39	73.76	56.01
5.00	57.89	85.46	88.78	88.87	88.88	88.87	88.86	88.55	73.94	56.24
6.00	58.56	88.76	92.35	92.44	92.45	92.45	92.43	92.10	76.25	56.73
7.00	58.82	88.94	92.53	92.63	92.64	92.64	92.61	92.28	76.45	56.97
8.00	59.36	91.18	94.94	95.04	95.05	95.05	95.03	94.69	78.05	57.37
9.00	59.58	91.34	95.10	95.20	95.22	95.22	95.19	94.84	78.24	57.64
10.00	60.07	93.25	97.14	97.25	97.27	97.26	97.23	96.87	79.62	58.01
11.00	60.32	93.43	97.32	97.44	97.45	97.45	97.41	97.05	79.81	58.23
12.00	60.67	94.43	98.39	98.51	98.53	98.53	98.49	98.12	80.58	58.52
13.00	60.88	94.59	98.56	98.68	98.71	98.71	98.65	98.28	80.76	58.74
14.00	61.23	95.68	99.79	99.94	99.96	99.96	99.90	99.48	81.57	59.04
15.00	61.45	95.84	99.99	100.13	100.16	100.16	100.10	99.67	81.75	59.22
16.00	61.63	95.74	99.87	100.02	100.05	100.05	99.98	99.55	81.75	59.39
17.00	61.83	95.90	100.05	100.21	100.24	100.24	100.17	99.73	81.94	59.64
18.00	62.05	96.28	100.50	100.66	100.70	100.69	100.62	100.17	82.28	59.86
19.00	62.25	96.45	100.68	100.85	100.89	100.89	100.81	100.35	82.45	60.03
20.00	62.49	96.91	101.21	101.39	101.43	101.43	101.34	100.88	82.84	60.23
21.00	62.66	97.05	101.37	101.55	101.60	101.60	101.50	101.04	82.99	60.38
22.00	58.33	61.48	62.71	62.86	62.91	62.91	62.80	62.43	59.72	57.73
22.50	56.94	56.53	56.72	56.83	56.88	56.88	56.78	56.61	56.50	56.75

Table B - 26. Temperature (°C) map of the west side of plate 3TT at MOC2 144A (92.1 EFPD).

Length of Plate (in)	Width of Plate (inches)									
	0.05	0.25	0.50	0.75	1.00	1.25	1.50	1.75	2.00	2.24
0.125	51.95	51.77	51.76	51.76	51.76	51.76	51.76	51.76	51.79	51.95
1.00	53.00	52.45	52.63	52.65	52.65	52.65	52.65	52.57	52.38	52.84
2.00	56.86	80.64	83.58	83.65	83.65	83.65	83.64	83.38	70.47	55.23
3.00	57.19	80.88	83.85	83.92	83.92	83.92	83.91	83.64	70.73	55.53
4.00	58.03	85.29	88.61	88.69	88.69	88.69	88.68	88.39	73.75	56.13
5.00	58.28	85.46	88.78	88.86	88.87	88.87	88.85	88.55	73.94	56.36
6.00	58.99	88.76	92.34	92.43	92.44	92.44	92.42	92.10	76.24	56.85
7.00	59.26	88.95	92.53	92.62	92.63	92.63	92.61	92.28	76.44	57.08
8.00	59.82	91.19	94.94	95.03	95.04	95.04	95.02	94.69	78.05	57.49
9.00	60.06	91.35	95.09	95.19	95.21	95.20	95.18	94.84	78.24	57.82
10.00	60.57	93.25	97.13	97.24	97.25	97.25	97.22	96.87	79.61	58.18
11.00	60.83	93.44	97.31	97.42	97.44	97.43	97.40	97.05	79.81	58.38
12.00	61.20	94.44	98.39	98.50	98.51	98.51	98.48	98.12	80.58	58.67
13.00	61.42	94.61	98.55	98.66	98.68	98.68	98.64	98.28	80.76	58.90
14.00	61.78	95.69	99.78	99.91	99.94	99.93	99.89	99.48	81.58	59.20
15.00	62.00	95.86	99.97	100.11	100.13	100.13	100.08	99.67	81.76	59.38
16.00	62.19	95.75	99.85	99.99	100.02	100.02	99.96	99.55	81.76	59.53
17.00	62.39	95.91	100.04	100.18	100.21	100.20	100.15	99.73	81.95	59.83
18.00	62.62	96.30	100.48	100.63	100.66	100.65	100.59	100.17	82.29	60.07
19.00	62.82	96.46	100.66	100.82	100.85	100.84	100.78	100.35	82.46	60.24
20.00	63.07	96.93	101.20	101.35	101.38	101.38	101.31	100.88	82.85	60.39
21.00	63.24	97.07	101.36	101.51	101.55	101.54	101.47	101.04	83.01	60.54
22.00	58.69	61.50	62.70	62.83	62.87	62.86	62.78	62.42	59.74	57.86
22.50	57.28	56.55	56.71	56.80	56.84	56.83	56.75	56.61	56.53	56.94

Table B - 27. Temperature (°C) map of the east side of plate 3BZ at MOC2 144A (92.1 EFPD).

Length of Plate (in)	Width of Plate (inches)									
	0.05	0.25	0.50	0.75	1.00	1.25	1.50	1.75	2.00	2.24
22.625	57.03	56.56	56.75	56.87	56.92	56.91	56.81	56.64	56.53	56.84
23.00	58.00	60.09	61.03	61.17	61.22	61.21	61.11	60.80	58.83	57.52
24.00	61.32	86.64	89.80	89.96	90.00	90.00	89.91	89.54	75.98	59.62
25.00	61.47	86.79	89.96	90.11	90.16	90.16	90.06	89.69	76.15	59.77
26.00	61.56	86.73	89.88	90.04	90.09	90.09	89.99	89.62	76.17	59.90
27.00	61.68	86.86	90.01	90.17	90.22	90.22	90.12	89.75	76.30	60.02
28.00	61.79	87.01	90.16	90.32	90.37	90.37	90.27	89.90	76.45	60.11
29.00	61.90	87.15	90.30	90.46	90.51	90.51	90.41	90.03	76.58	60.19
30.00	62.02	87.44	90.60	90.77	90.82	90.82	90.71	90.34	76.82	60.30
31.00	62.10	87.55	90.72	90.89	90.94	90.94	90.83	90.45	76.94	60.39
32.00	62.11	87.20	90.33	90.50	90.55	90.55	90.44	90.06	76.75	60.42
33.00	62.18	87.33	90.45	90.63	90.68	90.68	90.57	90.19	76.87	60.47
34.00	62.15	86.73	89.80	89.97	90.03	90.02	89.91	89.53	76.51	60.47
35.00	62.20	86.84	89.90	90.08	90.14	90.13	90.02	89.64	76.62	60.54
36.00	62.14	86.22	89.23	89.41	89.46	89.46	89.35	88.97	76.25	60.53
37.00	62.18	86.34	89.34	89.52	89.58	89.58	89.46	89.08	76.35	60.56
38.00	62.02	85.08	87.97	88.15	88.21	88.20	88.09	87.71	75.53	60.44
39.00	62.04	85.17	88.06	88.24	88.30	88.30	88.18	87.80	75.62	60.45
40.00	61.77	83.27	86.00	86.18	86.24	86.24	86.11	85.74	74.39	60.29
41.00	61.76	83.35	86.07	86.25	86.31	86.31	86.19	85.82	74.46	60.28
42.00	61.37	80.71	83.19	83.37	83.44	83.43	83.31	82.95	72.73	60.02
43.00	61.33	80.76	83.25	83.43	83.49	83.49	83.36	83.01	72.78	59.98
44.00	58.70	59.72	60.12	60.28	60.36	60.35	60.21	59.96	59.40	58.31
45.00	58.23	59.26	59.51	59.66	59.73	59.72	59.59	59.40	59.04	57.93

Table B - 28. Temperature (°C) map of the west side of plate 3BZ at MOC2 144A (92.1 EFPD).

Length of Plate (in)	Width of Plate (inches)									
	0.05	0.25	0.50	0.75	1.00	1.25	1.50	1.75	2.00	2.24
22.625	57.33	56.58	56.74	56.83	56.87	56.87	56.78	56.64	56.56	56.99
23.00	58.34	60.11	61.01	61.13	61.17	61.17	61.08	60.79	58.85	57.64
24.00	61.82	86.66	89.78	89.92	89.95	89.94	89.88	89.54	76.00	59.77
25.00	61.96	86.81	89.93	90.07	90.10	90.10	90.03	89.69	76.16	59.91
26.00	62.05	86.75	89.86	89.99	90.03	90.02	89.95	89.61	76.18	60.08
27.00	62.16	86.88	89.99	90.12	90.16	90.15	90.08	89.74	76.32	60.21
28.00	62.27	87.02	90.13	90.27	90.31	90.30	90.23	89.88	76.46	60.28
29.00	62.37	87.16	90.27	90.41	90.44	90.44	90.37	90.02	76.59	60.33
30.00	62.48	87.45	90.57	90.71	90.75	90.74	90.67	90.32	76.83	60.42
31.00	62.55	87.57	90.69	90.83	90.87	90.86	90.79	90.44	76.96	60.52
32.00	62.55	87.21	90.30	90.44	90.48	90.47	90.39	90.05	76.76	60.54
33.00	62.61	87.34	90.42	90.56	90.60	90.60	90.52	90.17	76.88	60.58
34.00	62.56	86.74	89.77	89.91	89.95	89.94	89.86	89.52	76.52	60.58
35.00	62.60	86.85	89.87	90.01	90.05	90.05	89.97	89.62	76.63	60.67
36.00	62.53	86.23	89.20	89.34	89.38	89.37	89.29	88.95	76.25	60.66
37.00	62.55	86.34	89.31	89.45	89.49	89.49	89.40	89.06	76.36	60.67
38.00	62.36	85.08	87.93	88.07	88.12	88.11	88.03	87.69	75.54	60.52
39.00	62.36	85.17	88.02	88.16	88.21	88.20	88.12	87.78	75.63	60.51
40.00	62.07	83.28	85.96	86.10	86.14	86.14	86.05	85.72	74.40	60.35
41.00	62.04	83.35	86.03	86.18	86.22	86.21	86.13	85.79	74.46	60.34
42.00	61.61	80.71	83.15	83.29	83.34	83.33	83.24	82.92	72.74	60.05
43.00	61.55	80.77	83.21	83.35	83.39	83.39	83.30	82.98	72.78	60.01
44.00	58.77	59.72	60.08	60.22	60.27	60.26	60.15	59.94	59.41	58.32
45.00	58.28	59.26	59.47	59.59	59.65	59.64	59.53	59.37	59.05	57.93

Table B - 29. Temperature (°C) map of the east side of plate 3TT at EOC 144A (101.0 EFPD).

Length of Plate (in)	Width of Plate (inches)									
	0.05	0.25	0.50	0.75	1.00	1.25	1.50	1.75	2.00	2.24
0.125	51.92	51.77	51.76	51.76	51.76	51.76	51.76	51.76	51.79	51.92
1.00	52.88	52.45	52.63	52.65	52.65	52.65	52.65	52.57	52.38	52.78
2.00	56.54	80.64	83.58	83.65	83.65	83.65	83.64	83.38	70.48	55.14
3.00	56.86	80.88	83.85	83.92	83.93	83.93	83.91	83.64	70.74	55.44
4.00	57.65	85.29	88.61	88.69	88.70	88.70	88.68	88.39	73.76	56.01
5.00	57.89	85.46	88.78	88.87	88.88	88.87	88.86	88.55	73.94	56.24
6.00	58.56	88.76	92.35	92.44	92.45	92.45	92.43	92.10	76.25	56.73
7.00	58.82	88.94	92.53	92.63	92.64	92.64	92.61	92.28	76.45	56.97
8.00	59.36	91.18	94.94	95.04	95.05	95.05	95.03	94.69	78.05	57.37
9.00	59.58	91.34	95.10	95.20	95.22	95.22	95.19	94.84	78.24	57.64
10.00	60.07	93.25	97.14	97.25	97.26	97.26	97.23	96.87	79.62	58.01
11.00	60.32	93.43	97.32	97.44	97.45	97.45	97.41	97.05	79.81	58.23
12.00	60.67	94.43	98.39	98.51	98.53	98.53	98.49	98.12	80.58	58.52
13.00	60.88	94.59	98.56	98.68	98.71	98.71	98.65	98.28	80.76	58.74
14.00	61.23	95.68	99.79	99.94	99.96	99.96	99.90	99.48	81.57	59.04
15.00	61.45	95.84	99.99	100.13	100.16	100.16	100.10	99.67	81.75	59.22
16.00	61.63	95.74	99.87	100.02	100.05	100.05	99.98	99.55	81.75	59.39
17.00	61.83	95.90	100.05	100.21	100.24	100.24	100.17	99.73	81.94	59.64
18.00	62.05	96.28	100.50	100.66	100.70	100.69	100.62	100.17	82.28	59.86
19.00	62.25	96.45	100.68	100.85	100.89	100.89	100.81	100.35	82.45	60.03
20.00	62.49	96.91	101.21	101.39	101.43	101.43	101.34	100.88	82.84	60.23
21.00	62.66	97.05	101.37	101.55	101.60	101.60	101.50	101.04	82.99	60.38
22.00	58.33	61.48	62.71	62.86	62.91	62.91	62.80	62.43	59.72	57.73
22.50	56.94	56.53	56.72	56.83	56.88	56.88	56.78	56.61	56.50	56.75

Table B - 30. Temperature (°C) map of the west side of plate 3TT at EOC 144A (101.0 EFPD).

Length of Plate (in)	Width of Plate (inches)									
	0.05	0.25	0.50	0.75	1.00	1.25	1.50	1.75	2.00	2.24
0.125	51.95	51.77	51.76	51.76	51.76	51.76	51.76	51.76	51.79	51.95
1.00	53.00	52.45	52.63	52.65	52.65	52.65	52.65	52.57	52.38	52.84
2.00	56.86	80.64	83.58	83.65	83.65	83.65	83.64	83.38	70.47	55.23
3.00	57.19	80.88	83.85	83.92	83.92	83.92	83.91	83.64	70.73	55.53
4.00	58.03	85.29	88.61	88.69	88.69	88.69	88.68	88.39	73.75	56.13
5.00	58.28	85.46	88.78	88.86	88.87	88.87	88.85	88.55	73.94	56.36
6.00	58.99	88.76	92.34	92.43	92.44	92.44	92.42	92.10	76.24	56.85
7.00	59.26	88.95	92.53	92.62	92.63	92.63	92.61	92.28	76.44	57.08
8.00	59.82	91.19	94.94	95.03	95.04	95.04	95.02	94.69	78.05	57.49
9.00	60.06	91.35	95.09	95.19	95.21	95.20	95.18	94.84	78.24	57.82
10.00	60.57	93.25	97.13	97.24	97.25	97.25	97.22	96.87	79.61	58.18
11.00	60.83	93.44	97.31	97.42	97.44	97.43	97.40	97.05	79.81	58.38
12.00	61.20	94.44	98.39	98.50	98.51	98.51	98.48	98.12	80.58	58.67
13.00	61.42	94.61	98.55	98.66	98.68	98.68	98.64	98.28	80.76	58.90
14.00	61.78	95.69	99.78	99.91	99.94	99.93	99.89	99.48	81.58	59.20
15.00	62.00	95.86	99.97	100.11	100.13	100.13	100.08	99.67	81.76	59.38
16.00	62.19	95.75	99.85	99.99	100.02	100.02	99.96	99.55	81.76	59.53
17.00	62.39	95.91	100.04	100.18	100.21	100.20	100.15	99.73	81.95	59.83
18.00	62.62	96.30	100.48	100.63	100.66	100.65	100.59	100.17	82.29	60.07
19.00	62.82	96.46	100.66	100.82	100.85	100.84	100.78	100.35	82.46	60.24
20.00	63.07	96.93	101.20	101.35	101.38	101.38	101.31	100.88	82.85	60.39
21.00	63.24	97.07	101.36	101.51	101.55	101.54	101.47	101.04	83.01	60.54
22.00	58.69	61.50	62.70	62.83	62.87	62.86	62.78	62.42	59.74	57.86
22.50	57.28	56.55	56.71	56.80	56.84	56.83	56.75	56.61	56.53	56.94

Table B - 31. Temperature (°C) map of the east side of plate 3BZ at EOC 144A (101.0 EFPD).

Length of Plate (in)	Width of Plate (inches)									
	0.05	0.25	0.50	0.75	1.00	1.25	1.50	1.75	2.00	2.24
22.625	57.03	56.56	56.75	56.87	56.92	56.91	56.81	56.64	56.53	56.84
23.00	58.00	60.09	61.03	61.17	61.22	61.21	61.11	60.80	58.83	57.52
24.00	61.32	86.64	89.80	89.96	90.00	90.00	89.91	89.54	75.98	59.62
25.00	61.47	86.79	89.96	90.11	90.16	90.16	90.06	89.69	76.15	59.77
26.00	61.56	86.73	89.88	90.04	90.09	90.09	89.99	89.62	76.17	59.90
27.00	61.68	86.86	90.01	90.17	90.22	90.22	90.12	89.75	76.30	60.02
28.00	61.79	87.01	90.16	90.32	90.37	90.37	90.27	89.90	76.45	60.11
29.00	61.90	87.15	90.30	90.46	90.51	90.51	90.41	90.03	76.58	60.19
30.00	62.02	87.44	90.60	90.77	90.82	90.82	90.71	90.34	76.82	60.30
31.00	62.10	87.55	90.72	90.89	90.94	90.94	90.83	90.45	76.94	60.39
32.00	62.11	87.20	90.33	90.50	90.55	90.55	90.44	90.06	76.75	60.42
33.00	62.18	87.33	90.45	90.63	90.68	90.68	90.57	90.19	76.87	60.47
34.00	62.15	86.73	89.80	89.97	90.03	90.02	89.91	89.53	76.51	60.47
35.00	62.20	86.84	89.90	90.08	90.14	90.13	90.02	89.64	76.62	60.54
36.00	62.14	86.22	89.23	89.41	89.46	89.46	89.35	88.97	76.25	60.53
37.00	62.18	86.34	89.34	89.52	89.58	89.58	89.46	89.08	76.35	60.56
38.00	62.02	85.08	87.97	88.15	88.21	88.20	88.09	87.71	75.53	60.44
39.00	62.04	85.17	88.06	88.24	88.30	88.30	88.18	87.80	75.62	60.45
40.00	61.77	83.27	86.00	86.18	86.24	86.24	86.11	85.74	74.39	60.29
41.00	61.76	83.35	86.07	86.25	86.31	86.31	86.19	85.82	74.46	60.28
42.00	61.37	80.71	83.19	83.37	83.44	83.43	83.31	82.95	72.73	60.02
43.00	61.33	80.76	83.25	83.43	83.49	83.49	83.36	83.01	72.78	59.98
44.00	58.70	59.72	60.12	60.28	60.36	60.35	60.21	59.96	59.40	58.31
45.00	58.23	59.26	59.51	59.66	59.73	59.72	59.59	59.40	59.04	57.93

Table B - 32. Temperature (°C) map of the west side of plate 3BZ at EOC 144A (101.0 EFPD).

Length of Plate (in)	Width of Plate (inches)									
	0.05	0.25	0.50	0.75	1.00	1.25	1.50	1.75	2.00	2.24
22.625	57.33	56.58	56.74	56.83	56.87	56.87	56.78	56.64	56.56	56.99
23.00	58.34	60.11	61.01	61.13	61.17	61.17	61.08	60.79	58.85	57.64
24.00	61.82	86.66	89.78	89.92	89.95	89.94	89.88	89.54	76.00	59.77
25.00	61.96	86.81	89.93	90.07	90.10	90.10	90.03	89.69	76.16	59.91
26.00	62.05	86.75	89.86	89.99	90.03	90.02	89.95	89.61	76.18	60.08
27.00	62.16	86.88	89.99	90.12	90.16	90.15	90.08	89.74	76.32	60.21
28.00	62.27	87.02	90.13	90.27	90.31	90.30	90.23	89.88	76.46	60.28
29.00	62.37	87.16	90.27	90.41	90.44	90.44	90.37	90.02	76.59	60.33
30.00	62.48	87.45	90.57	90.71	90.75	90.74	90.67	90.32	76.83	60.42
31.00	62.55	87.57	90.69	90.83	90.87	90.86	90.79	90.44	76.96	60.52
32.00	62.55	87.21	90.30	90.44	90.48	90.47	90.39	90.05	76.76	60.54
33.00	62.61	87.34	90.42	90.56	90.60	90.60	90.52	90.17	76.88	60.58
34.00	62.56	86.74	89.77	89.91	89.95	89.94	89.86	89.52	76.52	60.58
35.00	62.60	86.85	89.87	90.01	90.05	90.05	89.97	89.62	76.63	60.67
36.00	62.53	86.23	89.20	89.34	89.38	89.37	89.29	88.95	76.25	60.66
37.00	62.55	86.34	89.31	89.45	89.49	89.49	89.40	89.06	76.36	60.67
38.00	62.36	85.08	87.93	88.07	88.12	88.11	88.03	87.69	75.54	60.52
39.00	62.36	85.17	88.02	88.16	88.21	88.20	88.12	87.78	75.63	60.51
40.00	62.07	83.28	85.96	86.10	86.14	86.14	86.05	85.72	74.40	60.35
41.00	62.04	83.35	86.03	86.18	86.22	86.21	86.13	85.79	74.46	60.34
42.00	61.61	80.71	83.15	83.29	83.34	83.33	83.24	82.92	72.74	60.05
43.00	61.55	80.77	83.21	83.35	83.39	83.39	83.30	82.98	72.78	60.01
44.00	58.77	59.72	60.08	60.22	60.27	60.26	60.15	59.94	59.41	58.32
45.00	58.28	59.26	59.47	59.59	59.65	59.64	59.53	59.37	59.05	57.93